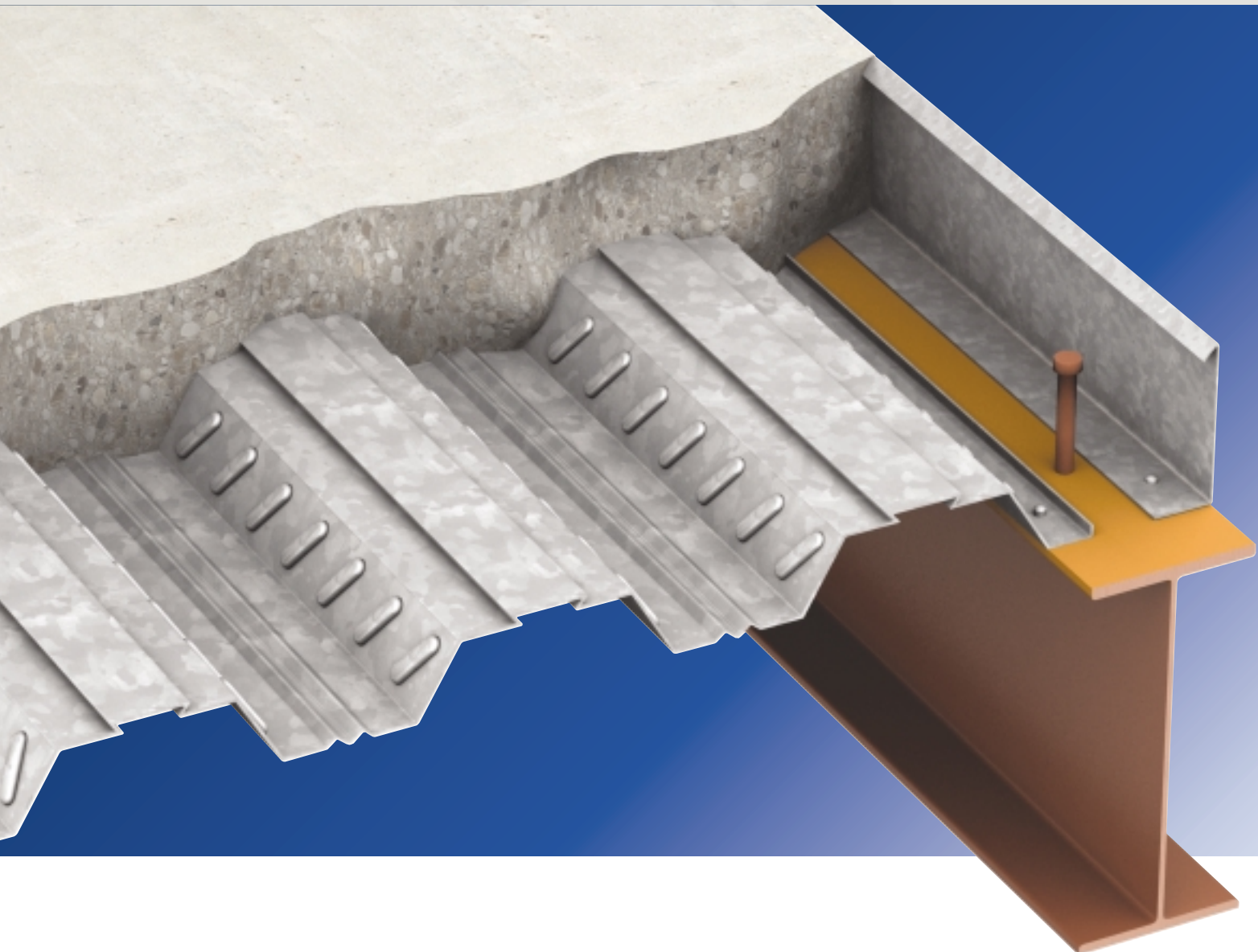


# MULTIDECK

COMPOSITE STEEL FLOORDECK





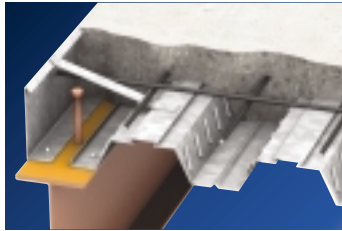
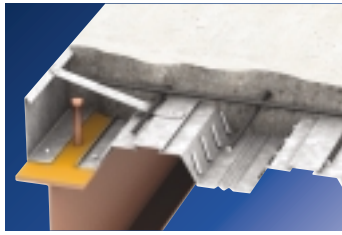
## Kingspan Toolkit

The Kingspan Multideck Design Software is a comprehensive package for the analysis and design of composite slabs and the selection of the correct Multideck product. It is available free of charge to qualifying specifiers. Full Structural Products literature is also available on the disc.

Should you require a copy or demonstration, please contact the Marketing Department on 01944 712000.

Store your copy of the Kingspan Toolkit CD here.

The contents of this Technical Handbook and CD are meant as a general introduction to Kingspan Structural Products and any purchaser, specifier or user retains the entire responsibility for satisfying himself, independently of anything herein, as to the suitability or fitness for purpose of any Kingspan product or system.



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# Kingspan Structural Products

## The Company

Kingspan Structural Products is one of Britain's leading designers and manufacturers of structural steel components for the construction industry.

Based in Sherburn, North Yorkshire Kingspan operates one of the largest and most advanced production complexes in Europe, manufacturing over 50,000 tonnes of steel products each year.

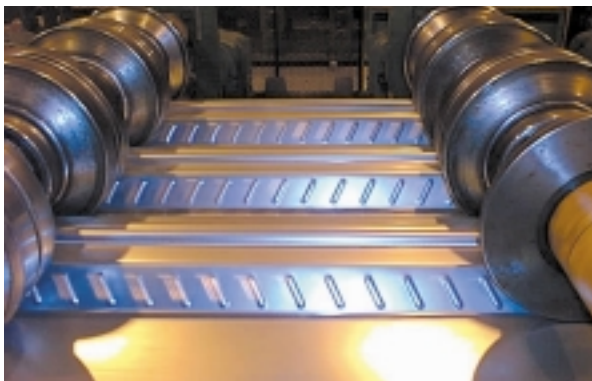


### Experience

From concept to design to manufacture and site installation, Kingspan Structural Products has an unmatched degree of experience and technical expertise in all aspects of steel construction.

### Technical Excellence

Over the years Kingspan Structural Products has been committed to advancing technology within the construction industry. Working in conjunction with the UK's leading experts in light gauge steel design the Company is continually refining and testing new and existing products with a view to the achievement of technical excellence and the establishment of higher standards in the industry.



### Commitment

It is this commitment and professional approach that has enabled the company to establish its outstanding reputation for service and quality and maintain its lead in a highly competitive field.



### Quality Assurance

Quality assurance is a fundamental feature of the Kingspan Structural Products operating policy.

From initial material testing for yield strength and thickness through to delivery on site all aspects of quality and service are monitored ensuring compliance with the requirements of BS ISO 9001:2000 Quality Systems.



### Customer Service

Kingspan offer a comprehensive advisory service to customers, specifiers and contractors on all aspects of specification and use of our product range.

Our specialist team of design engineers is available to answer technical queries regarding the use of our products in any application and our internal sales staff and customer services department provide a friendly and efficient service from initial enquiry through to site delivery of our products.



Personal contact is important. To ensure you are kept informed of the latest developments at Kingspan Structural Products our specially trained regionally based Sales Engineers are on hand to discuss your project personally and advise on the application and use of Kingspan Structural products.

More than just a Salesman, he is also trained to install and update our time saving range of computer software, available to all specifiers and users of our product range, as part of our comprehensive service package.

For customer service ring 01944 712000.



# Kingspan Multideck Profiled Steel Floordeck

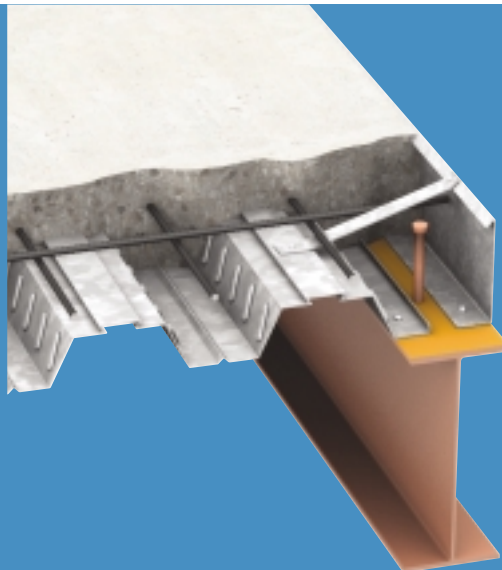
Welcome to the Kingspan Multideck floordeck handbook. Multideck profiles are high performance profiled galvanised steel decks manufactured in 350N/mm<sup>2</sup> steel for use in the construction of composite floor slabs.

This publication contains complete technical information on the following products manufactured by Kingspan Structural Products.



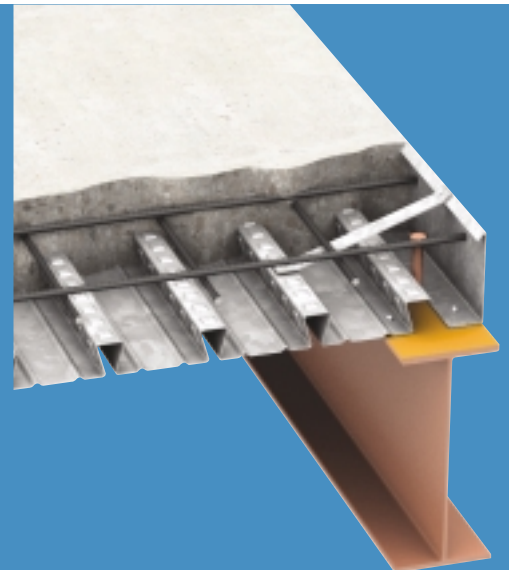
## Multideck 60-V2 Our most popular deck suitable for most applications

- 60mm trapezoidal profile giving maximum strength
- Spans up to 4.5m unpropped
- Gauge range 0.9mm through 1.2mm for economic solutions
- Efficient concrete cross section using up to 20% less concrete than other decks
- 1 hour fire performance with 130mm slab depth
- Fire performance up to 4 hours
- 1.0m cover width for rapid lay of deck on site
- Only deck to offer Dramix® fibre solution for improved site operations
- Acoustic robust solution
- Optimised for composite beam design



## Multideck 80-V2 For greater spans and concrete savings

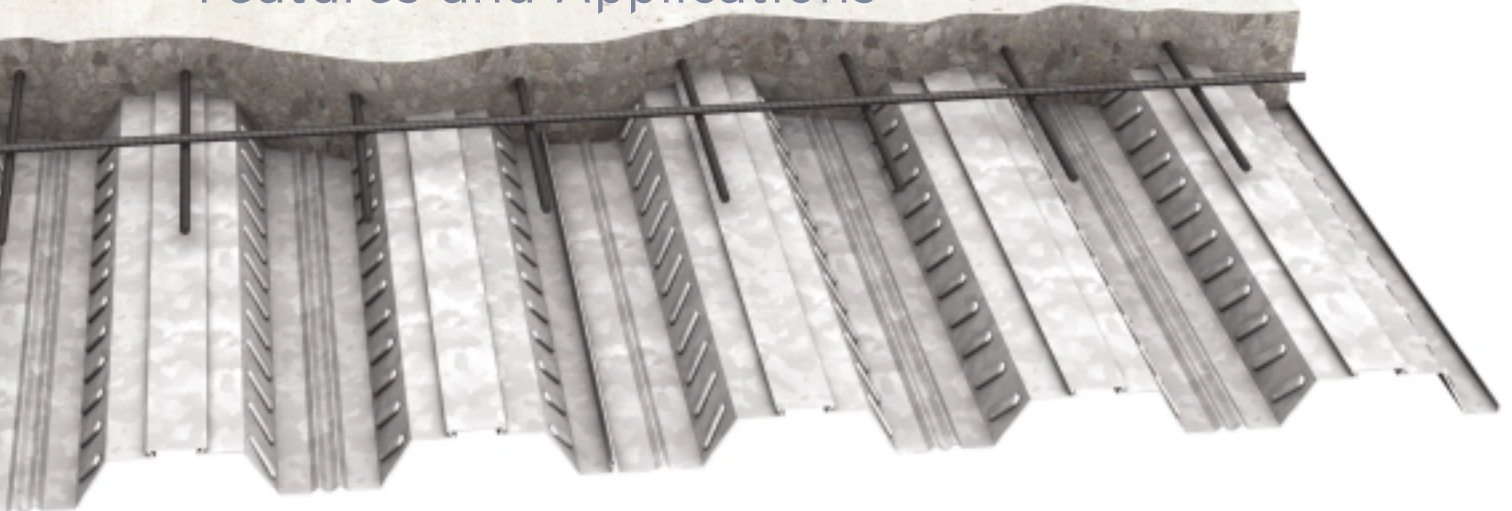
- 80mm trapezoidal profile giving maximum strength
- Spans up to 4.9m unpropped
- Gauge range 1.0mm through 1.2mm for economic solutions
- Efficient concrete cross section maximising performance
- 1 hour fire performance with 140mm slab depth
- Fire performance up to 4 hours
- Acoustic robust solution



## Multideck 50-V2 For minimum slab depth and robust acoustics

- 50mm 'Dovetail' rib profile, maximising deck bond to concrete
- Minimum slab depth of 100mm
- Spans up to 4.0m unpropped
- Gauge range 0.9mm through 1.2mm for economic solutions
- Shear keys on flange and webs of ribs gives class leading load capacity
- 1 hour fire performance with 100mm slab depth
- Fire performance up to 4 hours
- Acoustic robust solution

# Multideck 60-V2 Features and Applications



## Multideck 60-V2

The original and still the most popular deck in the market is a 60mm high, structurally efficient trapezoidal profile providing an excellent composite union between steel and concrete to maximise the load carrying and spanning up to 4.5m (no props). The efficient shape of the deck and resulting composite slab make an excellent option for composite beam design.

- **Concrete Volume Savings**

Due to its unique profile Multideck 60-V2 requires less concrete than other decks to achieve any given slab thickness. Multideck 60-V2 can save up to 10% concrete volume when compared with alternative trapezoidal profiles and over 20% concrete volume savings compared with typical re-entrant profiles. See graph below.

- **Value for Money**

Bulk steel buying by Kingspan ensures a quality product at the right price.

- **Greater Design Efficiency**

The larger range of Multideck gauge thicknesses available allow much closer matching of design requirements and deck performance. Kingspan Multideck 60-V2 can be used with Dramix® Steel Fibre Reinforcement to eliminate mesh in slab design.

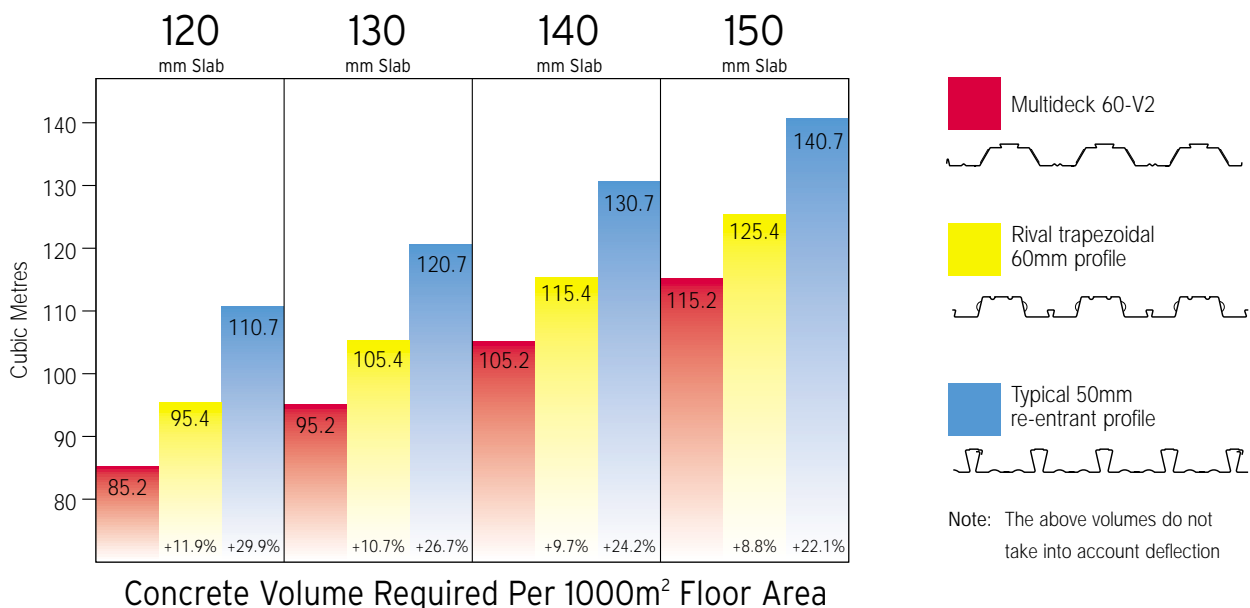
- **Quicker Installation**

The Multideck range has a 1m cover width requiring fewer panels and sidelaps. No temporary supports are required under most conditions. A wide range of accessories allows for easy installation of ceilings and services.

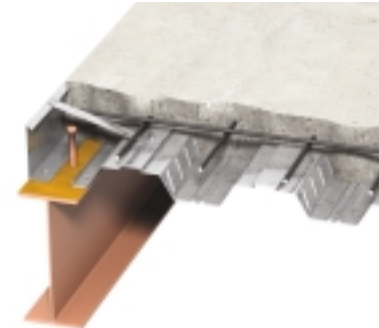
- **Technical Support**

The Multideck technical department provides a comprehensive design and advisory service to specifiers and end users. Further details are also available on the Kingspan Toolkit Software.

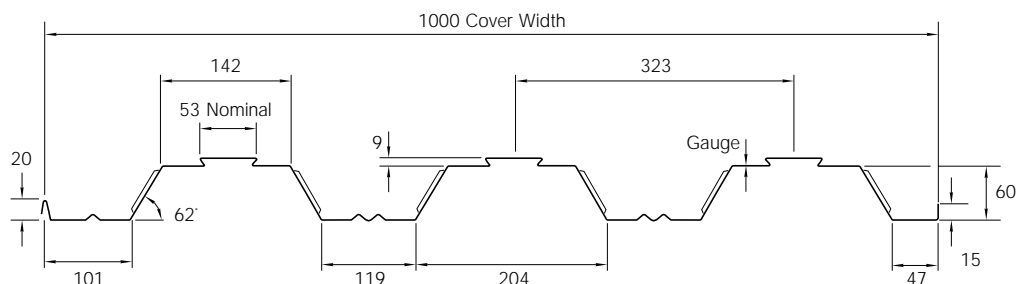
## Typical Concrete Volume Savings Using Multideck 60-V2



# Multideck 60-V2 Specification and Design



## Profile and Dimensions (mm)



Gauge = 0.9, 1.0, 1.1 & 1.2mm

Maximum length: 12 metres

## Section Properties per Metre Width

Normal Thickness (mm)	Self Weight		Height to Neutral Axis	Second Moment of Area (cm <sup>4</sup> /m)	Steel Area (mm <sup>2</sup> /m)	Ultimate Moment Capacity (kNm/m)	
	(kg/m <sup>2</sup> )	(kN/m <sup>2</sup> )	Sagging			Sagging	Hogging
0.90	9.34	0.092	39.40 mm	81.00	1137.87	7.09	6.95
1.00	10.37	0.102	36.60 mm	91.83	1270.18	8.41	8.06
1.10	11.41	0.112	35.00 mm	102.70	1402.49	9.72	9.15
1.20	12.45	0.122	35.00 mm	112.30	1534.80	11.01	10.22

## Material Specification - 350N/mm<sup>2</sup> Steel

Steel strip for Multideck 60-V2 complies with BS EN 10143 and BS EN 10147 with a guaranteed minimum yield strength of 350N/mm<sup>2</sup> and a minimum total coating mass (including both sides) of 275g/m<sup>2</sup>.

## Concrete Volumes & Specification

Load/span tables are based on Grade 30 concrete, having a design strength of 30N/mm<sup>2</sup>.

Density of normal weight concrete: 2400kg/m<sup>3</sup> at wet stage.

Density of lightweight concrete: 1900kg/m<sup>3</sup> at wet stage.

All concrete used with Multideck in the construction of composite slabs should comply with the recommendations in BS 8110: 1997.

## Reinforcement

Reinforcement of the slab to prevent cracking at all intermediate supports is required in BS 5950: Part 4 1994. Steel reinforcement for anti-crack or fire engineering purposes in accordance with British Standards: Hot rolled bars – BS 4449: 1997; Fabric reinforcement – BS 4483: 1998. A reinforced solution using Dramix® Steel Fibres from Bekaert is available see pages 17-19.

## Embossments

Raised diagonal embossments in opposite directions on each face of the webs of the decking provide the mechanical connection between the steel and the hardened concrete.

## References

Engineers are advised to consult SCI/MCRMA Technical Paper 13 'Composite Slabs and Beams using Steel Decking: Best Practice for Design and Construction'.

## Volume & Weight of Composite Slabs

Slab Depth (mm)	Concrete Volume (m <sup>3</sup> /m <sup>2</sup> )	Weight (kN/m <sup>2</sup> )			
		Normal weight Concrete		Lightweight Concrete	
		Wet	Dry	Wet	Dry
120	0.085	2.040	1.998	1.621	1.538
130	0.095	2.275	2.228	1.808	1.714
140	0.105	2.511	2.459	1.990	1.891
150	0.115	2.740	2.689	2.180	2.067
160	0.125	2.982	2.920	2.367	2.244
175	0.140	3.335	3.266	2.646	2.509
200	0.165	3.924	3.842	3.112	2.950
250	0.215	5.101	4.994	4.044	3.833

### Notes:

- 1 Important - Concrete volumes do not take into account deflection.
- 2 Excludes weight of steel decking and relates only to weight of concrete.
- 3 Concrete volumes are based upon a calculated minimum value. (Nominal slab depth)  
Account should be taken of deck and supporting structure deflections.



Photo Courtesy of MSW (UK) Ltd.



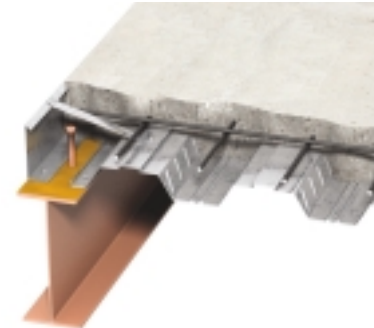
# Multideck 60-V2 Load Tables (Notes)


When using load tables for Multideck 60-V2 please take into consideration the following notes:

- 1 All tabulated figures include the self weight of the slab.
- 2 All tabulated figures include a construction allowance of 1.5kN/m<sup>2</sup> and for spans less than 3m construction allowance is 4.5/span.
- 3 The suggested maximum ratios of slab span to slab depth are 30 for LWC and 35 for NWC to control deflections. Deflection under construction loading (wet concrete etc.) has been limited to that stipulated in BS 5950: Part 4 1994.
- 4 Minimum reinforcement mesh sizes provide 0.1% of the gross cross-sectional area of the concrete at the support.
- 5 The composite slabs should meet the requirements of BS 5950: Part 4 1994 with regard to their composite behaviour under normal imposed loads.
- 6 Total applied load referred to in the load tables is a working load based on factored combinations of live loads, finishes, ceilings, services and partitions, divided by a load factor of 1.60 (excluding slab self weight).
- 7 Temporary supports should remain in place until the concrete has achieved its 75% of its 28 day cube strength often available after 7 days.
- 8 Where ★ appears the addition of props gives no further benefit in these cases.
- 9 Propped loads assume props are equally spaced.
- 10 Deck must lie flat on all support beams. Point only contact will affect design loading.
- 11 Where figures in red appear this shows the maximum permissible spans in situations where there is one stud per trough.
- 12 Span values are based on 100mm minimum support widths.
- 13 Construction stage spans are generally noted under the 4.0 kN/m<sup>2</sup> loads and shaded. For confirmation of maximum unpropped spans see page 65.

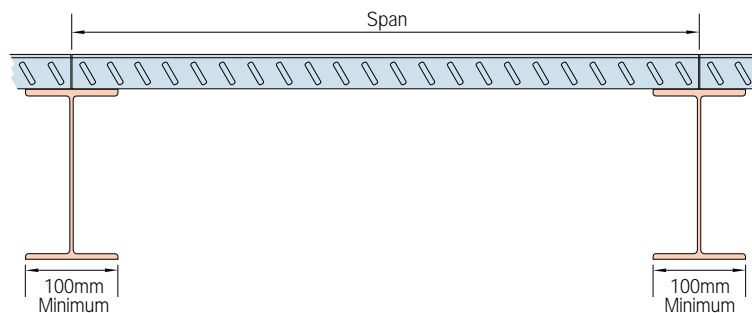


Citigroup Headquarters at Canary Wharf.  
Photo Courtesy of MSW (UK) Ltd.



 **Tip:** Use the Kingspan Toolkit CD with Word output to save time on your structural calculations.

## Definition of Span (Construction Stage) When Using Kingspan Load Tables



### Support widths greater than 100mm?

The span capacities shown on the following pages can be increased by the difference between the actual support widths and 100mm.

### Example

Support widths 140mm and 200mm.

Span values can be increased by  $(140 + 200)/2 - 100 = 70$ mm.

MD60-V2 1.2mm double span deck (no props).

150mm thick slab- normal weight concrete.

Construction stage span from page 11,

4.0kN/m<sup>2</sup> load column = 4000mm.

with support widths of 140 and 200 the increased span capacity is  $4000 + 70 = 4070$ mm.

# Multideck 60-V2

## Normal Weight Concrete Load Tables

### Unpropped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 9)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 0.9mm						Gauge = 1.0mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS						Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	120	A98	3.26	3.26	3.26	2.99 3.20	2.65 2.98	2.39 2.75	3.39	3.39	3.39	3.17 3.39	2.81 3.16	2.54 2.88
	130	A142	3.15	3.15	3.15	3.15	2.86 3.15	2.58 2.97	3.28	3.28	3.28	3.28	3.03 3.28	2.73 3.10
	140	A142	3.06	3.06	3.06	3.06	3.06	2.77 3.06	3.18	3.18	3.18	3.18	3.18	2.92 3.18
	150	A142	2.97	2.97	2.97	2.97	2.97	2.95 2.97	3.09	3.09	3.09	3.09	3.09	3.09
	160	A142	2.90	2.90	2.90	2.90	2.90	2.90	3.01	3.01	3.01	3.01	3.01	3.01
	175	A193	2.79	2.79	2.79	2.79	2.79	2.79	2.91	2.91	2.91	2.91	2.91	2.91
	200	A193	2.63	2.63	2.63	2.63	2.63	2.63	2.76	2.76	2.76	2.76	2.76	2.76
	250	A252	2.37	2.37	2.37	2.37	2.37	2.37	2.54	2.54	2.54	2.54	2.54	2.54
	120	A98	3.52	3.52	3.49 3.52	2.99 3.23	2.65 2.98	2.39 2.75	3.81	3.81	3.69 3.77	3.17 3.44	2.81 3.18	2.54 2.88
	130	A142	3.42	3.42	3.42	3.24 3.42	2.86 3.18	2.58 2.97	3.70	3.70	3.70	3.43 3.65	3.03 3.38	2.73 3.10
	140	A142	3.32	3.32	3.32	3.32	3.07 3.32	2.77 3.14	3.60	3.60	3.60	3.60	3.24 3.57	2.92 3.32
	150	A142	3.24	3.24	3.24	3.24	3.24	2.95 3.24	3.51	3.51	3.51	3.51	3.45 3.51	3.11 3.50
	160	A142	3.16	3.16	3.16	3.16	3.16	3.13 3.16	3.43	3.43	3.43	3.43	3.43	3.29 3.43
	175	A193	3.05	3.05	3.05	3.05	3.05	3.05	3.31	3.31	3.31	3.31	3.31	3.31
	200	A193	2.87	2.87	2.87	2.87	2.87	2.87	3.14	3.14	3.14	3.14	3.14	3.14
	250	A252	2.58	2.58	2.58	2.58	2.58	2.58	2.84	2.84	2.84	2.84	2.84	2.84

### Propped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 9)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 0.9mm						Gauge = 1.0mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS						Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	120	A98	4.20	★ 3.97	★	★	★	★	4.20	★ 4.18	★	★	★	★
	130	A142	4.55	3.77 4.20	★ 3.68	★	★	★	4.55	3.98 4.45	★ 3.84	★	★	★
	140	A142	4.88	3.99 4.90	3.42 4.41	★ 3.90	★ 3.46	★	4.90	4.20 4.69	★ 4.06	★	★	★
	150	A142	5.12	4.20 5.25	3.61 4.60	3.20 4.10	★ 3.65	★ 3.31	5.25	4.41 4.89	3.80 4.27	★ 3.80	★	★
	160	A142	5.34	4.40 5.45	3.79 4.78	3.36 4.30	3.03 3.83	★ 3.48	5.58	4.60 5.60	3.97 5.07	3.53 3.98	★ 3.62	★
	175	A193	5.64	4.67 5.69	4.04 5.01	3.58 4.53	3.24 4.09	★ 3.71	5.88	4.88 6.04	4.22 5.32	3.76 4.24	3.40 3.86	★ 3.55
	200	A193	5.70	5.08 5.35	4.41 4.87	3.93 4.47	3.56 4.07	3.27 3.76	6.24	5.29 5.68	4.61 5.16	4.11 4.63	3.73 4.22	3.43 3.89
250	A252	5.13	5.13	5.07 5.13	4.54 5.01	4.13 4.70	3.81 4.35	5.64	5.64	5.26 5.64	4.72 5.30	4.30 4.85	3.97 4.49	
	200	A193	6.03	★	★	★	★	★	★ 6.39	★	★	★	★	★
	250	A252	6.55	5.78 5.89	★ 5.40	★	★	★	6.94	5.99 6.24	★	★	★	★

#### Notes:

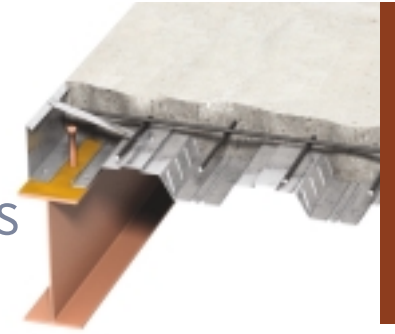
Total applied load referred to in the above table is a working load based on factored combinations of live loads, finishes, ceilings, services and partitions, divided by a load factor of 1.60 (excluding slab self weight).

Figures in red are maximum permissible spans in situations where there is one stud per trough.

Permanent Support ▲ Temporary Support ↑

# Multideck 60-V2

## Normal Weight Concrete Load Tables



### Unpropped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 9)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.1mm						Gauge = 1.2mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS						Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	120	A98	3.52	3.52	3.52	3.32 3.52	2.94 3.29	2.66 2.98	3.62	3.62	3.60	3.32 3.60	2.94 3.28	2.66 2.98
	130	A142	3.40	3.40	3.40	3.40	3.16 3.40	2.86 3.21	3.50	3.50	3.50	3.50	3.16 3.50	2.86 3.20
	140	A142	3.30	3.30	3.30	3.30	3.30	3.05 3.30	3.39	3.39	3.39	3.39	3.38 3.39	3.05 3.39
	150	A142	3.21	3.21	3.21	3.21	3.21	3.21	3.30	3.30	3.30	3.30	3.30	3.24 3.30
	160	A142	3.12	3.12	3.12	3.12	3.12	3.12	3.21	3.21	3.21	3.21	3.21	3.21
	175	A193	3.02	3.02	3.02	3.02	3.02	3.02	3.10	3.10	3.10	3.10	3.10	3.10
	200	A193	2.86	2.86	2.86	2.86	2.86	2.86	2.95	2.95	2.95	2.95	2.95	2.95
	250	A252	2.63	2.63	2.63	2.63	2.63	2.63	2.71	2.71	2.71	2.71	2.71	2.71
	120	A98	4.09	4.09	3.86 3.93	3.32 3.61	2.94 3.29	2.66 2.98	4.21	4.20	3.86 4.06	3.32 3.69	2.94 3.28	2.66 2.98
	130	A142	3.97	3.97	3.97	3.57 3.84	3.16 3.54	2.86 3.21	4.21	4.21	4.17 4.21	3.57 3.97	3.16 3.53	2.86 3.20
	140	A142	3.86	3.86	3.86	3.83 3.86	3.38 3.75	3.05 3.43	4.10	4.10	4.10	3.83 4.10	3.38 3.78	3.05 3.42
	150	A142	3.76	3.76	3.76	3.76	3.60 3.76	3.24 3.64	4.00	4.00	4.00	4.00	3.60 4.00	3.24 3.63
	160	A142	3.67	3.67	3.67	3.67	3.67	3.43 3.67	3.90	3.90	3.90	3.90	3.81 3.90	3.43 3.84
	175	A193	3.55	3.55	3.55	3.55	3.55	3.55	3.76	3.76	3.76	3.76	3.76	3.70 3.76
	200	A193	3.36	3.36	3.36	3.36	3.36	3.36	3.57	3.57	3.57	3.57	3.57	3.57
	250	A252	3.07	3.07	3.07	3.07	3.07	3.07	3.26	3.26	3.26	3.26	3.26	3.26

### Propped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

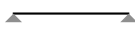
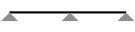
Span (m) (see diagram page 9)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.1mm						Gauge = 1.2mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS						Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	120	A98	4.20	★ 4.20	★	★	★	★	★	★	★	★	★	★
	130	A142	4.55	4.14 4.55	★	★	★	★	4.55	★	★	★	★	★
	140	A142	4.90	4.36 4.84	★ 4.19	★	★	★	4.90	4.36 4.83	★ 4.18	★	★	★
	150	A142	5.25	4.57 5.07	3.94 4.40	★ 3.92	★	★	5.25	4.57 5.06	★ 4.39	★	★	★
	160	A142	5.60	4.77 5.29	4.12 4.60	★ 4.10	★	★	5.60	4.77 5.28	4.12 4.59	★ 4.10	★	★
	175	A193	6.07	5.05 6.12	4.38 5.59	3.90 4.36	★ 3.97	★ 3.66	6.06	5.05 6.12	4.38 4.87	3.90 4.35	★ 3.96	★
	200	A193	6.51	5.47 6.71	4.76 5.96	4.25 5.30	3.86 4.75	3.56 4.00	6.51	5.46 6.98	4.76 5.29	4.25 4.75	3.86 4.33	★ 4.00
	250	A252	6.10	6.10	5.42 6.01	4.87 5.43	4.45 4.97	4.10 4.60	6.48	6.16 6.48	5.42 6.01	4.87 5.42	4.44 4.97	4.10 4.60
	200	A193	★	★	★	★	★	★	★	★	★	★	★	
	250	A252	7.23 7.29	★ 6.56	★	★	★	★	7.23 7.59	★ 6.79	★	★	★	★

# Multideck 60-V2 Lightweight Concrete Load Tables

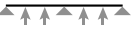
## Unpropped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 9)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 0.9mm						Gauge = 1.0mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS						Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	120 LWC A98		3.46	3.23	3.00	2.99 3.00	2.65 2.99	2.39 2.71	3.64	3.34	3.03	3.00	2.81 3.00	2.54 2.85
	130 LWC A142		3.37	3.37	3.25	3.24 3.25	2.86 3.21	2.58 2.93	3.52	3.52	3.27	3.25	3.03 3.25	2.73 3.07
	140 LWC A142		3.28	3.28	3.28	3.28	3.07 3.28	2.77 3.14	3.42	3.42	3.42	3.42	3.24 3.42	2.92 3.28
	150 LWC A142		3.19	3.19	3.19	3.19	3.19	2.95 3.19	3.32	3.32	3.32	3.32	3.32	3.11 3.32
	160 LWC A142		3.11	3.11	3.11	3.11	3.11	3.11	3.24	3.24	3.24	3.24	3.24	3.24
	175 LWC A193		3.01	3.01	3.01	3.01	3.01	3.01	3.13	3.13	3.13	3.13	3.13	3.13
	200 LWC A193		2.86	2.86	2.86	2.86	2.86	2.86	2.97	2.97	2.97	2.97	2.97	2.97
	250 LWC A252		2.60	2.60	2.60	2.60	2.60	2.60	2.74	2.74	2.74	2.74	2.74	2.74
	120 LWC A98		3.70	3.60	3.49 3.60	2.99 3.28	2.65 2.99	2.39 2.71	3.82	3.60	3.60	3.17 3.50	2.81 3.14	2.54 2.85
	130 LWC A142		3.63	3.63	3.63	3.24 3.50	2.86 3.23	2.58 2.93	3.93	3.90	3.90	3.43 3.72	3.03 3.39	2.73 3.07
	140 LWC A142		3.54	3.54	3.54	3.49 3.54	3.07 3.41	2.77 3.14	3.84	3.84	3.84	3.68 3.84	3.24 3.63	2.92 3.28
	150 LWC A142		3.45	3.45	3.45	3.45	3.28 3.45	2.95 3.34	3.75	3.75	3.75	3.75	3.45 3.75	3.11 3.49
	160 LWC A142		3.38	3.38	3.38	3.38	3.38	3.13 3.38	3.66	3.66	3.66	3.66	3.66	3.29 3.66
	175 LWC A193		3.27	3.27	3.27	3.27	3.27	3.27	3.55	3.55	3.55	3.55	3.55	3.55
	200 LWC A193		3.12	3.12	3.12	3.12	3.12	3.12	3.38	3.38	3.38	3.38	3.38	3.38
	250 LWC A252		2.83	2.83	2.83	2.83	2.83	2.83	3.10	3.10	3.10	3.10	3.10	3.10

## Propped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 9)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 0.9mm						Gauge = 1.0mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS						Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	120 LWC A98		★	★	★	★	★	★	★	★	★	★	★	★
	130 LWC A142		3.94	3.90	★ 3.75	★	★	★	4.06	★	★	★	★	★
	140 LWC A142		4.20	4.17 4.20	★ 3.98	★	★	★	4.31	4.20	★ 4.15	★	★	★
	150 LWC A142		4.50	4.41 4.50	3.75 4.21	★ 3.72	★	★	4.56	4.50	3.94 4.38	★ 3.87	★	★
	160 LWC A142		4.80	4.63 4.80	3.94 4.42	3.47 3.91	★ 3.53	★	4.81	4.80	4.14 4.59	★ 4.07	★	★
	175 LWC A193		5.25	4.94 5.21	4.22 4.68	3.72 4.18	3.35 3.77	★	5.25	5.16 5.25	4.42 4.90	3.90 4.34	★ 3.93	★
	200 LWC A193		6.00	5.42 5.59	4.65 5.04	4.10 4.56	3.70 3.94	3.38 3.47	6.00	5.64 5.93	4.84 5.34	4.28 4.76	3.87 4.11	3.54 3.62
	250 LWC A252		5.63	5.63	5.40 5.63	4.79 4.81	4.19	3.71	6.17	6.17	5.60 5.89	4.98 5.02	4.37	3.87
	200 LWC A193		★	★	★	★	★	★	★	★	★	★	★	★
	250 LWC A252		6.99	6.20	★	★	★	★	7.40	6.47 6.57	★	★	★	★

### Notes:

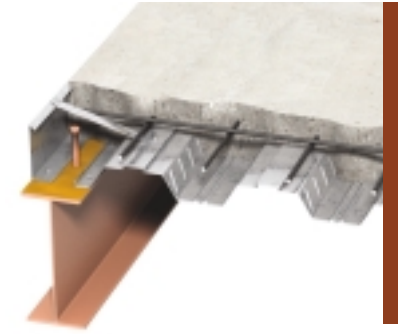
Total applied load referred to in the above table is a working load based on factored combinations of live loads, finishes, ceilings, services and partitions, divided by a load factor of 1.60 (excluding slab self weight).

Figures in red are maximum permissible spans in situations where there is one stud per trough.

Permanent Support ▲ Temporary Support ↑

# Multideck 60-V2

## Lightweight Concrete Load Tables



### Unpropped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 9)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.1mm						Gauge = 1.2mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS											
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	120 LWC A98		3.74	3.42	3.11	3.00	2.94 3.00	2.66 2.95	3.82	3.46	3.15	3.00	2.94 3.00	2.66 2.95
	130 LWC A142		3.65	3.65	3.34	3.25	3.16 3.25	2.86 3.18	3.72	3.72	3.39	3.25	3.16 3.25	2.86 3.17
	140 LWC A142		3.54	3.54	3.54	3.50	3.38 3.50	3.05 3.39	3.64	3.64	3.63	3.50	3.38 3.50	3.05 3.39
	150 LWC A142		3.44	3.44	3.44	3.44	3.44	3.24 3.44	3.54	3.54	3.54	3.54	3.54	3.24 3.54
	160 LWC A142		3.36	3.36	3.36	3.36	3.36	3.36	3.45	3.45	3.45	3.45	3.45	3.43 3.45
	175 LWC A193		3.24	3.24	3.24	3.24	3.24	3.24	3.34	3.34	3.34	3.34	3.34	3.34
	200 LWC A193		3.08	3.08	3.08	3.08	3.08	3.08	3.17	3.17	3.17	3.17	3.17	3.17
	250 LWC A252		2.84	2.84	2.84	2.84	2.84	2.84	2.92	2.92	2.92	2.92	2.92	2.92
	120 LWC A98		3.91	3.60	3.60	3.32 3.60	2.94 3.26	2.66 2.95	3.97	3.60	3.60	3.32 3.60	2.94 3.25	2.66 2.95
	130 LWC A142		4.21	3.90	3.90	3.57 3.90	3.16 3.51	2.86 3.18	4.27	3.90	3.90	3.57 3.90	3.16 3.50	2.86 3.17
	140 LWC A142		4.11	4.11	4.11	3.83 4.10	3.38 3.75	3.05 3.39	4.36	4.20	4.20	3.83 4.20	3.38 3.74	3.05 3.39
	150 LWC A142		4.02	4.02	4.02	4.02	3.60 3.98	3.24 3.60	4.26	4.26	4.26	4.07 4.26	3.60 3.98	3.24 3.60
	160 LWC A142		3.93	3.93	3.93	3.93	3.81 3.93	3.43 3.81	4.17	4.17	4.17	4.17	3.81 4.17	3.43 3.80
	175 LWC A193		3.81	3.81	3.81	3.81	3.81	3.70 3.81	4.04	4.04	4.04	4.04	4.04	3.70 4.04
	200 LWC A193		3.62	3.62	3.62	3.62	3.62	3.62	3.85	3.85	3.85	3.85	3.85	3.85
	250 LWC A252		3.33	3.33	3.33	3.33	3.33	3.33	3.53	3.53	3.53	3.53	3.53	3.53

### Propped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 9)

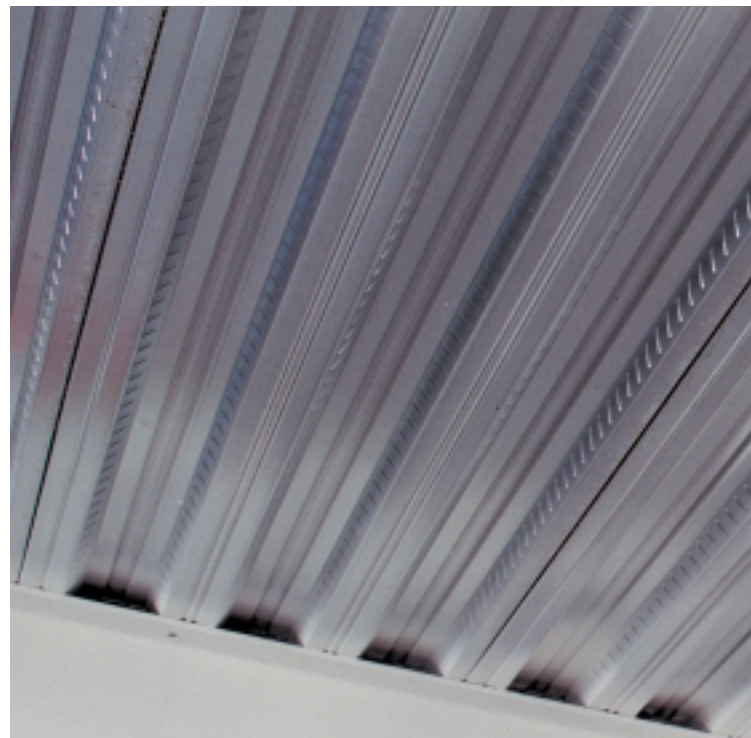
Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.1mm						Gauge = 1.2mm						
			Total Applied Load (kN/m <sup>2</sup> ) SLS												
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0	
	120 LWC A98		★	★	★	★	★	★	★	★	★	★	★	★	
	130 LWC A142		★	★	★	★	★	★	★	★	★	★	★	★	
	140 LWC A142		4.41	4.20	★	★	★	★	4.46	★	★	★	★	★	
	150 LWC A142		4.66	4.50	4.09 4.50	★	★	★	4.72	4.50	★	★	★	★	
	160 LWC A142		4.91	4.80	4.29 4.73	★	★	★	4.97	4.80	4.29 4.72	★	★	★	
	175 LWC A193		5.28	5.25	4.57 5.04	4.04 4.47	★	★	5.35	5.25	4.57 5.03	★	★	★	
	200 LWC A193		6.00	5.82	5.01 6.00	4.44 5.51	4.01 4.27	★	★	6.00	5.82	5.01 6.00	4.43 4.89	4.00 4.39	★
	250 LWC A252		6.62	6.62	5.77 6.10	5.13 5.20	4.53	4.01	7.03	6.65	5.77 6.29	5.13 5.35	4.65 4.66	4.13	
	200 LWC A193		★	★	★	★	★	★	★	★	★	★	★	★	
	250 LWC A252		7.50	★	★	★	★	★	7.50	★	★	★	★	★	

# Multideck 60-V2 Fire Performance

## Fire Performance

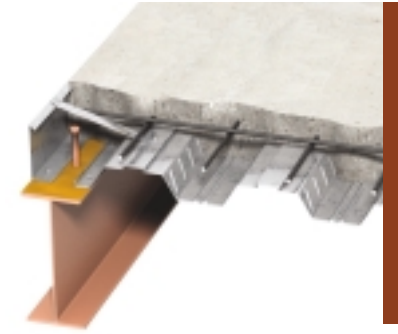
- 1 The fire resistance tables for MD60-V2 following are based upon fire test data from full scale tests performed at the Warrington Fire Research Centre, April 1991.
- 2 All stated slab depths comply with the minimum fire insulation criteria of BS 476: Part 20 1987.
- 3 The composite slab is assumed to be continuous over one or more intermediate supports. i.e. minimum double span.
- 4 For 2 hour rated slabs the mesh noted within the 'End Span' table should be continuous over the first internal support, with the mesh shown in the 'Internal Span' table being applicable over the second internal support and subsequent spans.
- 5 Minimum laps should be 300mm for A142 mesh and 400mm for A193 and A252 mesh.
- 6 The mesh should be placed between 20 & 40mm from the upper surface of the slab. (This range caters for lap areas.)
- 7 The tables are based upon Grade 30 concrete, reinforcement having a yield strength of 460N/mm<sup>2</sup>.
- 8 The tables must be read in conjunction with load/span tables for Multideck 60-V2 to verify the structural integrity of the composite slab.
- 9 The values in all the tables are relevant to unpropped construction. For propped and single span conditions use the Kingspan Toolkit Software or contact Kingspan Technical Services.
- 10 The tables take into account the reduced partial factor of 0.8 as permitted in BS 5950: Part 8 for non-permanent imposed loads. The tables are presented in terms of total specified imposed load (non-permanent and permanent). It is assumed that the permanent imposed loads for partitions, finishes, ceilings and services are equivalent to 1.7kN/m<sup>2</sup> in all cases. The tables are therefore appropriate for office type applications.  
  
For other applications where the imposed loads are almost entirely permanent the total load should be adjusted accordingly before reading from the tables,  
  
eg:  
150mm normal weight concrete plantroom slab and A142 mesh  
7.5kN/m<sup>2</sup> live load  
1.2kN/m<sup>2</sup> 50mm screed finish 0.5kN/m<sup>2</sup> ceilings and services  
1 hour fire rating  
  
**Multideck 60-V2 profile**  
**Total applied load = 1.2 + 0.5 + 7.5/0.8 = 11.075kN/m<sup>2</sup>**  
**From table overleaf maximum span = 3.14m.**
- 11 The \* denotes that the mesh provided, although satisfying the fire resistance requirement, does not comply with the minimum anti-crack reinforcement requirement of BS 5950: Part 4. Refer to standard load/span tables for minimum mesh requirements.

- 12 For loan/span conditions beyond the scope of these tables the Fire Engineering Method as detailed in the SCI Publication 056 should be adopted or use Kingspan Toolkit Software. Please contact our Technical Services Department for advice. See following pages for MD 60-V2 Fire Resistance Tables.
- 13 Multideck 60-V2 can be used with Dramix® Steel Fibre Reinforcement as an alternative to conventional fire engineering using steel mesh. (see pages 17-19)



# Multideck 60-V2

## Fire Resistance Load Tables



### Unpropped - Normal Weight Concrete

Span (m)

Slab Depth (mm)	Min Mesh Size	Fire rating: 1.0 hour										Fire rating: 1.5 hours									
		Total Applied Load (kN/m <sup>2</sup> )										Total Applied Load (kN/m <sup>2</sup> )									
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00		
130	A142	4.01	3.78	3.58	3.43	3.27	3.15	3.03	2.93	2.83	-	-	-	-	-	-	-	-	-		
130	A193	4.33	4.08	3.87	3.70	3.53	3.40	3.27	3.17	3.06	-	-	-	-	-	-	-	-	-		
130	A252	4.55	4.39	4.16	3.98	3.79	3.65	3.51	3.40	3.29	-	-	-	-	-	-	-	-	-		
140	A142	4.18	3.94	3.74	3.58	3.42	3.30	3.17	3.07	2.97	3.65	3.44	3.27	3.13	2.99	2.89	2.78	2.70	2.61		
140	A193	4.52	4.26	4.05	3.88	3.70	3.57	3.43	3.33	3.22	4.00	3.77	3.58	3.43	3.28	3.16	3.04	2.95	2.85		
140	A252	4.87	4.59	4.36	4.17	3.98	3.84	3.69	3.58	3.46	4.35	4.10	3.89	3.73	3.56	3.43	3.30	3.20	3.10		
150	A142	4.25	4.01	3.82	3.66	3.50	3.38	3.25	3.15	3.05	3.79	3.58	3.41	3.27	3.13	3.02	2.91	2.82	2.73		
150	A193	4.60	4.34	4.13	3.96	3.78	3.65	3.52	3.41	3.30	4.16	3.94	3.74	3.59	3.43	3.31	3.19	3.09	2.99		
150	A252	4.96	4.69	4.45	4.27	4.08	3.94	3.79	3.68	3.56	4.53	4.28	4.07	3.90	3.73	3.60	3.47	3.36	3.25		
160	A142	4.30	4.07	3.87	3.72	3.56	3.44	3.31	3.21	3.11	3.85	3.65	3.48	3.34	3.19	3.08	2.97	2.88	2.79		
160	A193	4.65	4.40	4.19	4.02	3.85	3.72	3.58	3.47	3.36	4.23	4.01	3.82	3.66	3.50	3.38	3.26	3.16	3.06		
160	A252	5.02	4.75	4.52	4.34	4.15	4.01	3.86	3.74	3.62	4.61	4.37	4.16	3.99	3.82	3.69	3.55	3.45	3.34		
175	A142	4.37	4.15	3.95	3.80	3.64	3.52	3.40	3.30	3.20	3.91	3.71	3.54	3.40	3.26	3.15	3.04	2.96	2.87		
175	A193	4.72	4.48	4.28	4.11	3.94	3.81	3.67	3.57	3.46	4.29	4.07	3.88	3.73	3.58	3.46	3.34	3.24	3.14		
175	A252	5.09	4.83	4.61	4.43	4.24	4.10	3.95	3.84	3.72	4.67	4.43	4.23	4.07	3.90	3.77	3.63	3.53	3.42		
200	*A142	4.47	4.26	4.07	3.92	3.77	3.65	3.53	3.43	3.33	3.99	3.80	3.64	3.51	3.37	3.26	3.15	3.07	2.98		
200	A193	4.83	4.60	4.40	4.24	4.07	3.94	3.81	3.70	3.59	4.37	4.17	3.99	3.84	3.69	3.57	3.45	3.36	3.26		
200	A252	5.20	4.95	4.74	4.56	4.38	4.24	4.10	3.99	3.87	4.76	4.54	4.34	4.18	4.02	3.89	3.76	3.66	3.55		
250	*A142	4.63	4.43	4.26	4.12	3.98	3.86	3.74	3.65	3.55	4.11	3.94	3.79	3.67	3.54	3.44	3.33	3.25	3.16		
250	*A193	4.99	4.78	4.60	4.45	4.29	4.16	4.03	3.93	3.82	4.50	4.31	4.15	4.01	3.87	3.76	3.64	3.55	3.45		
250	A252	5.36	5.14	4.94	4.78	4.61	4.48	4.34	4.23	4.11	4.89	4.69	4.51	4.36	4.21	4.09	3.96	3.86	3.75		

### Unpropped - Normal Weight Concrete

Span (m)

Slab Depth (mm)	Min Mesh Size	Fire rating: 2.0 hours – end span										Fire rating: 2.0 hours – internal span									
		Total Applied Load (kN/m <sup>2</sup> )										Total Applied Load (kN/m <sup>2</sup> )									
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00		
130	A142	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
130	A193	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
130	A252	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
140	A142	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
140	A193	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
140	A252	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
150	A142	3.36	3.18	3.03	2.91	2.78	2.68	2.58	2.50	2.42	4.05	3.83	3.64	3.49	3.34	3.22	3.10	3.01	2.91		
150	A193	3.74	3.54	3.36	3.22	3.08	2.98	2.87	2.78	2.69	4.53	4.28	4.07	3.90	3.73	3.60	3.47	3.36	3.25		
150	A252	4.11	3.89	3.70	3.55	3.39	3.27	3.15	3.05	2.95	5.00	4.73	4.49	4.31	4.12	3.97	3.82	3.71	3.59		
160	A142	3.48	3.30	3.14	3.02	2.89	2.79	2.69	2.61	2.53	4.24	4.01	3.82	3.67	3.51	3.39	3.27	3.17	3.07		
160	A193	3.88	3.67	3.50	3.36	3.21	3.10	2.99	2.90	2.81	4.76	4.51	4.29	4.12	3.94	3.80	3.66	3.55	3.44		
160	A252	4.27	4.05	3.85	3.70	3.54	3.42	3.29	3.19	3.09	5.27	4.99	4.75	4.56	4.36	4.21	4.05	3.93	3.81		
175	A142	3.52	3.35	3.19	3.07	2.95	2.85	2.75	2.67	2.59	4.34	4.12	3.93	3.78	3.62	3.50	3.38	3.28	3.18		
175	A193	3.93	3.73	3.56	3.42	3.28	3.17	3.06	2.97	2.88	4.89	4.64	4.43	4.26	4.08	3.94	3.80	3.69	3.58		
175	A252	4.33	4.11	3.92	3.77	3.62	3.50	3.37	3.27	3.17	5.42	5.15	4.91	4.72	4.52	4.37	4.21	4.09	3.96		
200	*A142	3.59	3.42	3.27	3.15	3.03	2.94	2.84	2.76	2.68	4.49	4.28	4.10	3.95	3.79	3.67	3.55	3.45	3.35		
200	A193	4.00	3.81	3.65	3.52	3.38	3.27	3.16	3.07	2.98	5.07	4.83	4.62	4.45	4.27	4.14	4.00	3.89	3.77		
200	A252	4.41	4.20	4.02	3.87	3.72	3.60	3.48	3.38	3.28	5.63	5.37	5.13	4.94	4.75	4.60	4.44	4.32	4.19		
250	*A142	3.68	3.53	3.39	3.28	3.17	3.08	2.98	2.91	2.83	4.72	4.52	4.35	4.21	4.06	3.94	3.82	3.72	3.62		
250	*A193	4.10	3.93	3.78	3.66	3.53	3.43	3.32	3.24	3.15	5.34	5.11	4.92	4.76	4.59	4.46	4.32	4.21	4.09		
250	A252	4.52	4.33	4.16	4.03	3.89	3.78	3.66	3.57	3.47	5.95	5.70	5.48	5.30	5.11	4.96	4.81	4.69	4.56		

# Multideck 60-V2

## Fire Resistance Load Tables

### Unpropped - Lightweight Concrete

Span (m)

Slab Depth (mm)	Min Mesh Size	Fire rating: 1.0 hour									Fire rating: 1.5 hours								
		Total Applied Load (kN/m <sup>2</sup> )									Total Applied Load (kN/m <sup>2</sup> )								
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
120 LWC A142		3.60	3.60	3.56	3.39	3.22	3.10	2.97	2.87	2.77	-	-	-	-	-	-	-	-	
120 LWC A193		3.60	3.60	3.60	3.54	3.48	3.35	3.21	3.10	2.99	-	-	-	-	-	-	-	-	
120 LWC A252		3.60	3.60	3.60	3.60	3.60	3.53	3.45	3.34	3.22	-	-	-	-	-	-	-	-	
130 LWC A142		3.90	3.90	3.76	3.59	3.41	3.28	3.14	3.04	2.94	3.80	3.56	3.36	3.21	3.05	2.94	2.82	2.73	2.63
130 LWC A193		3.90	3.90	3.90	3.80	3.69	3.55	3.41	3.30	3.18	3.90	3.90	3.70	3.53	3.35	3.22	3.09	2.99	2.89
130 LWC A252		3.90	3.90	3.90	3.90	3.90	3.79	3.67	3.55	3.42	3.90	3.90	3.90	3.78	3.65	3.51	3.37	3.26	3.14
140 LWC A142		4.20	4.12	3.90	3.72	3.54	3.41	3.27	3.17	3.06	3.98	3.74	3.54	3.38	3.21	3.09	2.97	2.88	2.78
140 LWC A193		4.20	4.20	4.20	4.03	3.85	3.70	3.55	3.44	3.32	4.20	4.12	3.89	3.72	3.54	3.41	3.27	3.16	3.05
140 LWC A252		4.20	4.20	4.20	4.18	4.16	4.00	3.84	3.71	3.58	4.20	4.20	4.20	4.03	3.86	3.71	3.56	3.45	3.33
150 LWC A142		4.46	4.20	3.97	3.80	3.62	3.49	3.35	3.24	3.13	4.04	3.80	3.60	3.44	3.28	3.16	3.03	2.94	2.84
150 LWC A193		4.50	4.50	4.31	4.12	3.93	3.79	3.63	3.51	3.39	4.45	4.19	3.96	3.79	3.61	3.48	3.34	3.23	3.12
150 LWC A252		4.50	4.50	4.50	4.37	4.24	4.08	3.92	3.79	3.66	4.50	4.50	4.33	4.14	3.94	3.80	3.65	3.53	3.41
160 LWC A142		4.53	4.26	4.04	3.87	3.69	3.56	3.42	3.31	3.20	4.09	3.85	3.65	3.50	3.34	3.22	3.09	2.99	2.89
160 LWC A193		4.80	4.63	4.38	4.19	4.00	3.85	3.70	3.59	3.47	4.51	4.24	4.02	3.85	3.67	3.54	3.40	3.29	3.18
160 LWC A252		4.80	4.80	4.73	4.52	4.31	4.15	3.99	3.87	3.74	4.80	4.64	4.39	4.20	4.01	3.86	3.71	3.59	3.47
175 LWC *A142		4.62	4.36	4.14	3.97	3.79	3.65	3.51	3.40	3.29	4.16	3.93	3.73	3.57	3.41	3.29	3.17	3.07	2.97
175 LWC A193		5.00	4.72	4.48	4.29	4.10	3.95	3.80	3.69	3.57	4.58	4.32	4.10	3.93	3.75	3.62	3.48	3.38	3.27
175 LWC A252		5.25	5.09	4.83	4.63	4.42	4.26	4.10	3.97	3.84	5.00	4.72	4.48	4.29	4.10	3.95	3.80	3.69	3.57
200 LWC *A142		4.74	4.49	4.28	4.11	3.93	3.80	3.66	3.55	3.44	4.26	4.03	3.84	3.69	3.53	3.41	3.29	3.19	3.09
200 LWC A193		5.13	4.86	4.63	4.44	4.25	4.11	3.96	3.84	3.72	4.68	4.43	4.22	4.05	3.88	3.75	3.61	3.50	3.39
200 LWC A252		5.53	5.24	4.99	4.79	4.58	4.42	4.26	4.13	4.00	5.11	4.84	4.61	4.42	4.23	4.09	3.94	3.82	3.70
250 LWC *A142		4.94	4.71	4.51	4.35	4.18	4.05	3.91	3.80	3.69	4.41	4.21	4.03	3.88	3.73	3.61	3.49	3.40	3.30
250 LWC *A193		5.34	5.09	4.87	4.69	4.51	4.37	4.22	4.10	3.98	4.84	4.61	4.42	4.26	4.09	3.96	3.83	3.72	3.61
250 LWC A252		5.74	5.47	5.24	5.05	4.85	4.69	4.53	4.41	4.28	5.28	5.03	4.81	4.64	4.46	4.32	4.17	4.05	3.93

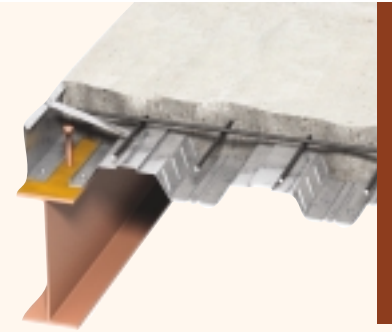
### Unpropped - Lightweight Concrete

Span (m)

Slab Depth (mm)	Min Mesh Size	Fire rating: 2.0 hours – end span									Fire rating: 2.0 hours – internal span								
		Total Applied Load (kN/m <sup>2</sup> )									Total Applied Load (kN/m <sup>2</sup> )								
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
120 LWC A142		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
120 LWC A193		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
120 LWC A252		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
130 LWC A142		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
130 LWC A193		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
130 LWC A252		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
140 LWC A142		3.60	3.38	3.19	3.05	2.91	2.80	2.69	2.60	2.51	4.20	4.10	3.87	3.70	3.52	3.39	3.25	3.15	3.04
140 LWC A193		4.02	3.77	3.56	3.40	3.24	3.12	3.00	2.90	2.80	4.20	4.20	4.20	4.08	3.96	3.81	3.66	3.54	3.42
140 LWC A252		4.20	4.16	3.93	3.75	3.57	3.44	3.30	3.19	3.08	4.20	4.20	4.20	4.20	4.20	4.13	4.05	3.92	3.78
150 LWC A142		3.71	3.49	3.30	3.16	3.01	2.90	2.79	2.70	2.61	4.50	4.28	4.05	3.87	3.69	3.55	3.41	3.30	3.19
150 LWC A193		4.15	3.91	3.70	3.54	3.37	3.25	3.12	3.02	2.92	4.50	4.50	4.50	4.34	4.17	4.01	3.85	3.73	3.60
150 LWC A252		4.50	4.31	4.08	3.90	3.72	3.58	3.44	3.33	3.22	4.50	4.50	4.50	4.50	4.50	4.39	4.27	4.13	3.99
160 LWC A142		3.75	3.53	3.35	3.21	3.06	2.95	2.83	2.74	2.65	4.64	4.37	4.14	3.96	3.78	3.64	3.50	3.39	3.27
160 LWC A193		4.20	3.95	3.75	3.59	3.42	3.30	3.17	3.07	2.97	4.80	4.80	4.68	4.47	4.26	4.11	3.95	3.82	3.69
160 LWC A252		4.64	4.36	4.14	3.96	3.77	3.64	3.50	3.39	3.27	4.80	4.80	4.80	4.77	4.74	4.56	4.38	4.24	4.10
175 LWC *A142		3.80	3.59	3.41	3.27	3.12	3.01	2.90	2.81	2.72	4.75	4.48	4.26	4.08	3.89	3.75	3.61	3.50	3.39
175 LWC A193		4.25	4.01	3.81	3.65	3.49	3.37	3.24	3.14	3.04	5.25	5.07	4.81	4.61	4.40	4.24	4.08	3.96	3.83
175 LWC A252		4.70	4.43	4.21	4.03	3.85	3.71	3.57	3.46	3.35	5.25	5.25	5.25	5.08	4.90	4.72	4.54	4.40	4.25
200 LWC *A142		3.87	3.67	3.49	3.35	3.21	3.10	2.99	2.90	2.81	4.91	4.65	4.43	4.25	4.07	3.93	3.79	3.68	3.56
200 LWC A193		4.33	4.10	3.91	3.75	3.59	3.47	3.34	3.24	3.14	5.56	5.27	5.02	4.82	4.61	4.45	4.29	4.16	4.03
200 LWC A252		4.78	4.53	4.31	4.14	3.96	3.83	3.69	3.58	3.47	6.00	5.87	5.59	5.36	5.13	4.95	4.77	4.63	4.48
250 LWC *A142		3.99	3.80	3.64	3.51	3.37	3.27	3.16	3.07	2.98	5.17	4.92	4.71	4.54	4.36	4.22	4.08	3.97	3.85
250 LWC *A193		4.45	4.24	4.06	3.91	3.76	3.64	3.52	3.42	3.32	5.86	5.58	5.34	5.14	4.94	4.79	4.63	4.50	4.36
250 LWC A252		4.91	4.68	4.48	4.32	4.15	4.02	3.88	3.77	3.66	6.55	6.24	5.97	5.75	5.52	5.34	5.16	5.02	4.87



# Kingspan and Bekaert Composite Slab



Multideck 60-V2

## No Mesh Construction

**Dramix® Steel Fibre Concrete**, has been used worldwide in groundworks, for many years. Following extensive test work and analysis by the Steel Construction Institute, it is now available for multi-storey applications. Dramix steel fibres with Multideck 60-V2 have been proven to achieve a full fire performance for 1 - 1.5 hours (see pages 20 & 23).

Following further developmental work, **Dramix®** is now available for use with Multideck 80-V2 with a fire performance of 1 - 1.5 hours (see pages 34-37) and also Multideck 50-V2 with a rating of 1 - 2 hours (see pages 50-53).

The use of a **Dramix®** Steel Fibre reinforced Concrete slab provides a “pre-reinforced” concrete slab  
**- no mesh has to be installed.**

## Construction Advantages

- Pre-Reinforced Concrete
- Simplified process
- No mesh to transport, buy, store, lay etc...
- Time savings on site
- Earlier project completion
- Concrete volume savings
- Reduction in crane hire time

## Technical Advantages

- Proven 1 hour, 1.5 and 2.0 hour fire rating
- Structural design information developed by SCI
- Full depth reinforcement offers excellent crack control
  - Design advice and assistance

## Health & Safety Advantages

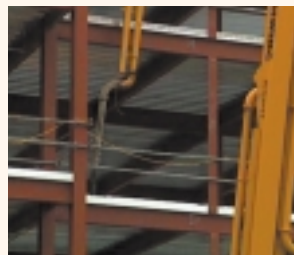
- Minimises site handling
- Reduces site congestion
- Minimises crane lifts
- Eliminates hand carrying of mesh into position
- Reduces tripping hazards



Steel fibres added to hopper



Fibres mix perfectly with concrete



Concrete pumped into position



Mixture spread onto deck



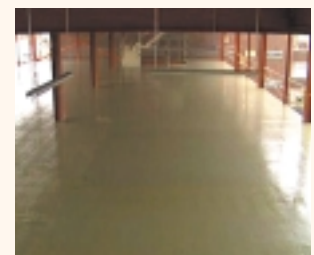
No mesh means no tripping hazard



Mixture floated off



Floating provides a smooth finish



Floor completed in double quick time



Dramix® eliminates the need to buy, transport, store, crane and fix mesh.

# Kingspan and Bekaert Composite Slab



## Multideck 50-V2

Multideck 50-V2 has been tested with the new Dramix® steel fibres in order to achieve full fire performance for 1, 1.5 and 2 hours



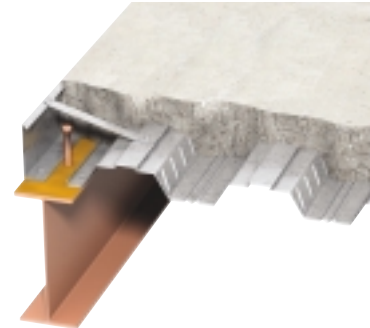
## Multideck 60-V2

Multideck 60-V2 and the standard Dramix® steel fibre has been proven by testing to achieve full fire performance of 1 - 1.5 hours



## Multideck 80-V2

Multideck 80-V2 has been tested with the new Dramix® steel fibres in order to achieve full fire performance of 1 - 1.5 hours



## Dramix® Fibres

Dramix® fibres are made from prime quality hard-drawn steel-wire to ensure high tensile strength and close tolerances.

Dramix® fibres are added to the concrete during mixing. The gluing of the fibres into bundles guarantees quick and easy mixing with perfectly homogeneous distribution. The hooked ends slowly deforms during pull-out and is generally considered as the best form of anchorage. Dramix® steel fibres are manufactured in accordance with the ISO 9001 quality specifications.

## Shear Strength

The shear resistance of Dramix® concrete reinforced with 30kg/m<sup>3</sup> RC-65/60-BN / 20kg/m<sup>3</sup> RC-80/60-BN exceeds that of mesh reinforced concrete. This means that codified checks for longitudinal shear can be adopted and will not penalise fibre reinforced slabs. For 30kg/m<sup>3</sup> the area of fibres crossing a shear plane may be taken as 0.37% of the concrete area.

## Shear Stud Capacities

The SCI has established the following design information relating to shear stud strengths from the test data:

- In order to design studs embedded in fibre reinforced concrete with a dosage of 30 kg/m<sup>3</sup> of Dramix® RC-65/60-BN or 20 kg/m<sup>3</sup> of Dramix® RC-80/60-BN fibres in accordance with BS5950: Part 3: 1990 no shear stud strength reduction factor is applicable.
- In order to design studs embedded in fibre reinforced concrete with a dosage of 30 kg/m<sup>3</sup> of Dramix® RC-65/60-BN or 20 kg/m<sup>3</sup> of Dramix® RC-80/60-BN fibres in accordance with DD Env 1994-1-1: 1994 no shear stud strength reduction factor is applicable.

## Recommendations When Mixing

### 1. General

- preferably use a central batching plant mixer.
- a continuous grading is preferred.
- mix until all glued fibres are separated into individual fibres. Fibres don't increase mixing time significantly.
- if special cements or admixtures are used, a preliminary test is recommended.

### 2. Fibre Addition

#### 2.1. In batching plant mixer.

- never add fibres as first component in the mixer.
- fibres can be introduced together with sand and aggregates, or can be added in freshly mixed concrete.
- only for drummixer: unopened degradable bags can be thrown directly in the mixer.

#### 2.2. Truckmixer

- add Dramix® as the final component into the back of the mixer truck.
- run mixer at drum speed: 12-18 rpm.
- adjust slump to a min. of 12 cm (preferably with water reducing agents or high water reducing agents).
- add fibres with maximum speed of 40 kg/min.
- optional equipment: belt-hoist elevator .
- after adding the fibres, continue mixing at highest speed for 4-5 min.



### 2.3. Automatic dosing

- Fibres can be dosed from bulk at rates up to 3.5 kg/sec with a specially developed dosing equipment.

Should you require further information please contact Bekaert for:

- Composite slab design
- Dramix® data sheet RC-65/60-BN / RC-80/60-BN
- Fire test report
- Composite slab load-span tables
- Composite slab fire resistance tables
- SCI reports

## Technical Support

Technical support in the development of the Dramix® composite floor load-span tables was provided by the SCI.

## Fire Test Report

Fire resistance test in accordance with BS476-Part 21 - 1987 Clause 7 on a load bearing Dramix® composite floor and Kingspan Multideck 60-V2. (24 page document is available on request from Bekaert).

**Warrington**  
**FIREFIRE**  
**research**

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# Multideck 60-V2

## Fire Resistance Load Tables

### Dramix® Reinforced Concrete

#### (30kg/m<sup>3</sup> RC-65/60-BN)

### 1 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 0.9mm							Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
130	3.52	3.16	3.02	2.81	2.68	2.49	2.32	3.58	3.22	3.08	2.87	2.74	2.56	2.40
140	3.80	3.43	3.27	3.04	2.86	2.64	2.46	3.85	3.47	3.33	3.09	2.93	2.71	2.52
150	4.08	3.67	3.49	3.20	3.00	2.77	2.58	4.13	3.74	3.56	3.29	3.09	2.85	2.65
160	4.39	3.91	3.70	3.37	3.18	2.93	2.74	4.43	3.99	3.79	3.46	3.25	3.00	2.81
170	4.63	4.09	3.85	3.51	3.31	3.06	2.86	4.68	4.18	3.94	3.60	3.40	3.14	2.93
180	4.89	4.26	4.01	3.68	3.47	3.21	3.00	4.96	4.36	4.11	3.75	3.54	3.28	3.07
190	5.11	4.43	4.18	3.83	3.62	3.36	3.15	5.21	4.55	4.29	3.93	3.72	3.44	3.22
200	5.30	4.61	4.36	4.00	3.79	3.51	3.29	5.40	4.71	4.44	4.08	3.86	3.58	3.36
210	5.46	4.77	4.51	4.15	3.93	3.65	3.43	5.56	4.86	4.60	4.23	4.00	3.72	3.50
220	5.62	4.93	4.67	4.31	4.08	3.80	3.57	5.72	5.01	4.75	4.38	4.15	3.86	3.63
230	5.77	5.08	4.82	4.46	4.23	3.93	3.70	5.87	5.18	4.91	4.54	4.30	4.01	3.77
240	5.94	5.25	4.99	4.62	4.39	4.09	3.85	6.03	5.33	5.06	4.68	4.45	4.15	3.90
250	6.11	5.42	5.15	4.78	4.54	4.24	4.00	6.18	5.48	5.22	4.83	4.60	4.29	4.04

### 1.5 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 0.9mm							Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
140	3.19	2.83	2.68	2.47	2.32	2.14	1.99	3.25	2.87	2.73	2.53	2.38	2.19	2.04
150	3.47	3.05	2.89	2.63	2.47	2.28	2.13	3.54	3.11	2.95	2.70	2.54	2.34	2.18
160	3.73	3.27	3.07	2.79	2.63	2.43	2.27	3.80	3.33	3.14	2.86	2.70	2.49	2.33
170	3.98	3.46	3.25	2.97	2.79	2.58	2.42	4.04	3.52	3.31	3.02	2.85	2.64	2.47
180	4.17	3.61	3.40	3.11	2.93	2.72	2.54	4.23	3.68	3.46	3.17	2.99	2.77	2.59
190	4.36	3.78	3.56	3.27	3.09	2.86	2.68	4.43	3.84	3.62	3.33	3.15	2.91	2.73
200	4.54	3.95	3.73	3.43	3.25	3.01	2.83	4.61	4.01	3.79	3.48	3.29	3.06	2.87
210	4.72	4.12	3.90	3.60	3.40	3.17	2.97	4.76	4.16	3.94	3.63	3.43	3.19	3.00
220	4.86	4.27	4.04	3.73	3.54	3.29	3.09	4.93	4.33	4.10	3.79	3.59	3.34	3.14
230	5.03	4.43	4.20	3.88	3.68	3.43	3.22	5.09	4.48	4.25	3.93	3.73	3.48	3.27
240	5.16	4.57	4.33	4.02	3.82	3.56	3.35	5.23	4.62	4.40	4.07	3.86	3.61	3.40
250	5.33	4.72	4.50	4.17	3.97	3.70	3.49	5.36	4.75	4.52	4.19	3.99	3.72	3.50

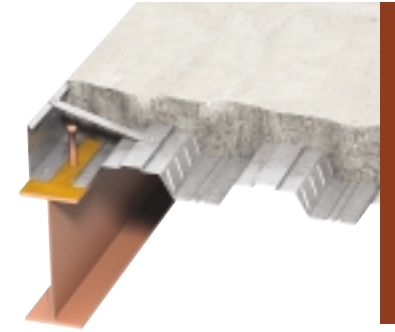
**Notes:**

These tables are not applicable to slabs where the deck is supplied in single span lengths (use Multideck Design software to determine suitable bottom bar requirements)

# Multideck 60-V2

## Fire Resistance Load Tables

### Dramix® Reinforced Concrete (30kg/m<sup>3</sup> RC-65/60-BN)



#### 1 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 1.1mm							Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
130	3.61	3.25	3.12	2.92	2.79	2.61	2.45	3.66	3.29	3.16	2.97	2.83	2.66	2.51
140	3.90	3.53	3.39	3.15	3.00	2.79	2.60	3.94	3.58	3.44	3.22	3.07	2.86	2.67
150	4.20	3.82	3.64	3.38	3.19	2.94	2.75	4.23	3.85	3.68	3.43	3.25	3.00	2.80
160	4.47	4.04	3.85	3.54	3.33	3.08	2.87	4.51	4.10	3.91	3.62	3.41	3.15	2.94
170	4.74	4.27	4.04	3.69	3.48	3.22	3.00	4.79	4.34	4.13	3.78	3.56	3.29	3.08
180	5.01	4.46	4.19	3.84	3.62	3.36	3.14	5.06	4.55	4.29	3.93	3.70	3.43	3.21
190	5.25	4.61	4.36	4.00	3.77	3.50	3.28	5.32	4.72	4.44	4.08	3.86	3.58	3.35
200	5.47	4.78	4.51	4.15	3.93	3.65	3.42	5.55	4.87	4.60	4.23	4.00	3.71	3.48
210	5.66	4.94	4.68	4.31	4.08	3.79	3.56	5.76	5.04	4.76	4.39	4.15	3.86	3.62
220	5.81	5.10	4.83	4.46	4.22	3.93	3.69	5.90	5.18	4.90	4.53	4.29	3.99	3.75
230	5.96	5.25	4.98	4.61	4.37	4.07	3.83	6.04	5.32	5.04	4.66	4.43	4.12	3.87
240	6.11	5.40	5.13	4.75	4.51	4.21	3.96	6.18	5.47	5.19	4.81	4.57	4.26	4.00
250	6.27	5.56	5.29	4.90	4.66	4.36	4.10	6.33	5.61	5.34	4.96	4.72	4.40	4.15

#### 1.5 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 1.1mm							Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
140	3.30	2.93	2.78	2.58	2.43	2.24	2.09	3.34	2.97	2.82	2.61	2.48	2.28	2.13
150	3.58	3.17	3.00	2.76	2.60	2.40	2.23	3.63	3.22	3.06	2.82	2.65	2.44	2.28
160	3.86	3.40	3.21	2.93	2.75	2.54	2.38	3.90	3.44	3.26	2.98	2.80	2.59	2.42
170	4.10	3.58	3.37	3.08	2.90	2.68	2.51	4.15	3.65	3.43	3.14	2.96	2.73	2.55
180	4.31	3.75	3.53	3.23	3.05	2.83	2.65	4.36	3.81	3.58	3.29	3.10	2.87	2.68
190	4.50	3.91	3.69	3.39	3.20	2.97	2.78	4.56	3.97	3.75	3.44	3.25	3.01	2.83
200	4.68	4.08	3.85	3.54	3.35	3.11	2.91	4.75	4.13	3.90	3.59	3.40	3.15	2.96
210	4.86	4.24	4.01	3.70	3.50	3.25	3.05	4.92	4.29	4.07	3.75	3.55	3.30	3.10
220	5.00	4.39	4.15	3.83	3.64	3.39	3.18	5.06	4.44	4.21	3.89	3.68	3.43	3.22
230	5.15	4.54	4.31	3.98	3.78	3.52	3.31	5.22	4.60	4.36	4.04	3.83	3.57	3.36
240	5.29	4.68	4.44	4.12	3.91	3.65	3.43	5.36	4.74	4.50	4.17	3.96	3.69	3.47
250	5.41	4.80	4.57	4.24	4.03	3.76	3.54	5.47	4.86	4.62	4.29	4.08	3.81	3.58

**Notes:**

These tables are not applicable to slabs where the deck is supplied in single span lengths (use Multideck Design software to determine suitable bottom bar requirements)

# Multideck 60-V2

## Fire Resistance Load Tables

### Dramix® Reinforced Concrete

#### (30kg/m<sup>3</sup> RC-65/60-BN)

### 1 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 0.9mm							Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
120	3.47	3.02	2.87	2.68	2.55	2.38	2.23	3.53	3.07	2.92	2.72	2.60	2.43	2.29
130	3.73	3.30	3.15	2.93	2.79	2.57	2.38	3.79	3.35	3.20	2.99	2.84	2.64	2.46
140	4.05	3.60	3.43	3.17	2.97	2.72	2.53	4.11	3.65	3.49	3.24	3.06	2.81	2.61
150	4.38	3.90	3.70	3.36	3.15	2.89	2.68	4.43	3.94	3.75	3.46	3.24	2.97	2.75
160	4.68	4.16	3.92	3.54	3.32	3.04	2.83	4.73	4.22	4.00	3.63	3.40	3.12	2.90
170	4.97	4.40	4.10	3.71	3.48	3.20	2.97	5.02	4.47	4.19	3.79	3.56	3.27	3.04
180	5.26	4.59	4.29	3.89	3.65	3.36	3.13	5.31	4.68	4.38	3.97	3.73	3.43	3.20
190	5.54	4.76	4.46	4.05	3.81	3.51	3.27	5.61	4.89	4.57	4.15	3.90	3.60	3.36
200	5.83	4.97	4.66	4.25	3.99	3.68	3.43	5.86	5.07	4.75	4.33	4.07	3.75	3.50
210	6.03	5.15	4.83	4.40	4.15	3.83	3.58	6.14	5.24	4.92	4.48	4.22	3.90	3.64
220	6.24	5.35	5.02	4.59	4.33	4.00	3.74	6.33	5.43	5.10	4.66	4.40	4.06	3.79
230	6.45	5.55	5.22	4.78	4.51	4.17	3.90	6.54	5.62	5.29	4.85	4.58	4.23	3.96
240	6.61	5.72	5.39	4.94	4.66	4.32	4.04	6.70	5.79	5.46	5.00	4.72	4.37	4.09
250	6.83	5.92	5.58	5.13	4.85	4.50	4.21	6.89	5.97	5.64	5.18	4.90	4.54	4.25

### 1.5 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 0.9mm							Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
130	3.14	2.78	2.63	2.43	2.30	2.11	1.97	3.19	2.84	2.69	2.49	2.36	2.18	2.02
140	3.45	3.05	2.88	2.65	2.49	2.28	2.11	3.50	3.11	2.94	2.71	2.55	2.34	2.17
150	3.77	3.32	3.12	2.84	2.66	2.44	2.27	3.81	3.36	3.18	2.90	2.72	2.49	2.32
160	4.08	3.56	3.34	3.02	2.83	2.60	2.42	4.11	3.61	3.40	3.08	2.89	2.65	2.47
170	4.35	3.76	3.51	3.18	2.99	2.75	2.56	4.40	3.83	3.58	3.24	3.04	2.79	2.61
180	4.61	3.97	3.71	3.36	3.16	2.91	2.72	4.67	4.04	3.77	3.43	3.22	2.96	2.75
190	4.87	4.18	3.91	3.55	3.34	3.08	2.87	4.93	4.23	3.97	3.61	3.39	3.12	2.91
200	5.09	4.34	4.07	3.71	3.49	3.22	3.00	5.15	4.40	4.13	3.76	3.54	3.26	3.05
210	5.31	4.54	4.25	3.89	3.66	3.38	3.15	5.40	4.62	4.33	3.96	3.72	3.44	3.22
220	5.50	4.71	4.43	4.04	3.82	3.53	3.29	5.58	4.79	4.50	4.11	3.88	3.58	3.35
230	5.68	4.90	4.61	4.22	3.98	3.68	3.44	5.79	4.98	4.68	4.29	4.05	3.75	3.50
240	5.88	5.08	4.79	4.39	4.15	3.84	3.59	5.91	5.11	4.82	4.41	4.17	3.86	3.61
250	6.04	5.24	4.94	4.54	4.29	3.98	3.72	6.10	5.29	4.99	4.58	4.33	4.02	3.76

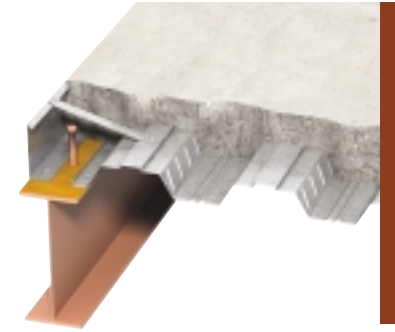
**Notes:**

These tables are not applicable to slabs where the deck is supplied in single span lengths (use Multideck Design software to determine suitable bottom bar requirements)

# Multideck 60-V2

## Fire Resistance Load Tables

### Dramix® Reinforced Concrete (30kg/m<sup>3</sup> RC-65/60-BN)



#### 1 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 1.1mm							Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
120	3.60	3.13	2.97	2.78	2.65	2.49	2.35	3.65	3.18	3.02	2.83	2.70	2.54	2.40
130	3.84	3.40	3.25	3.04	2.90	2.70	2.53	3.89	3.43	3.29	3.08	2.95	2.75	2.59
140	4.17	3.70	3.54	3.29	3.13	2.89	2.68	4.20	3.74	3.58	3.35	3.18	2.95	2.75
150	4.47	3.99	3.82	3.53	3.32	3.04	2.83	4.50	4.03	3.86	3.58	3.39	3.11	2.89
160	4.78	4.28	4.07	3.72	3.49	3.20	2.97	4.82	4.33	4.12	3.80	3.57	3.28	3.04
170	5.04	4.54	4.28	3.87	3.63	3.34	3.11	5.09	4.58	4.36	3.96	3.71	3.41	3.18
180	5.34	4.77	4.46	4.04	3.80	3.50	3.25	5.40	4.86	4.56	4.14	3.89	3.58	3.33
190	5.65	4.97	4.65	4.22	3.97	3.66	3.41	5.68	5.04	4.72	4.29	4.04	3.72	3.47
200	5.92	5.13	4.81	4.38	4.12	3.80	3.54	5.97	5.23	4.90	4.47	4.20	3.87	3.61
210	6.20	5.32	4.99	4.55	4.29	3.96	3.70	6.25	5.40	5.07	4.62	4.36	4.02	3.75
220	6.42	5.50	5.17	4.72	4.46	4.12	3.85	6.51	5.58	5.25	4.79	4.52	4.18	3.90
230	6.61	5.69	5.36	4.91	4.63	4.29	4.00	6.69	5.76	5.43	4.97	4.68	4.33	4.05
240	6.79	5.86	5.53	5.07	4.79	4.43	4.15	6.86	5.93	5.58	5.12	4.84	4.48	4.19
250	6.97	6.05	5.71	5.25	4.96	4.60	4.30	7.06	6.13	5.78	5.31	5.02	4.65	4.36

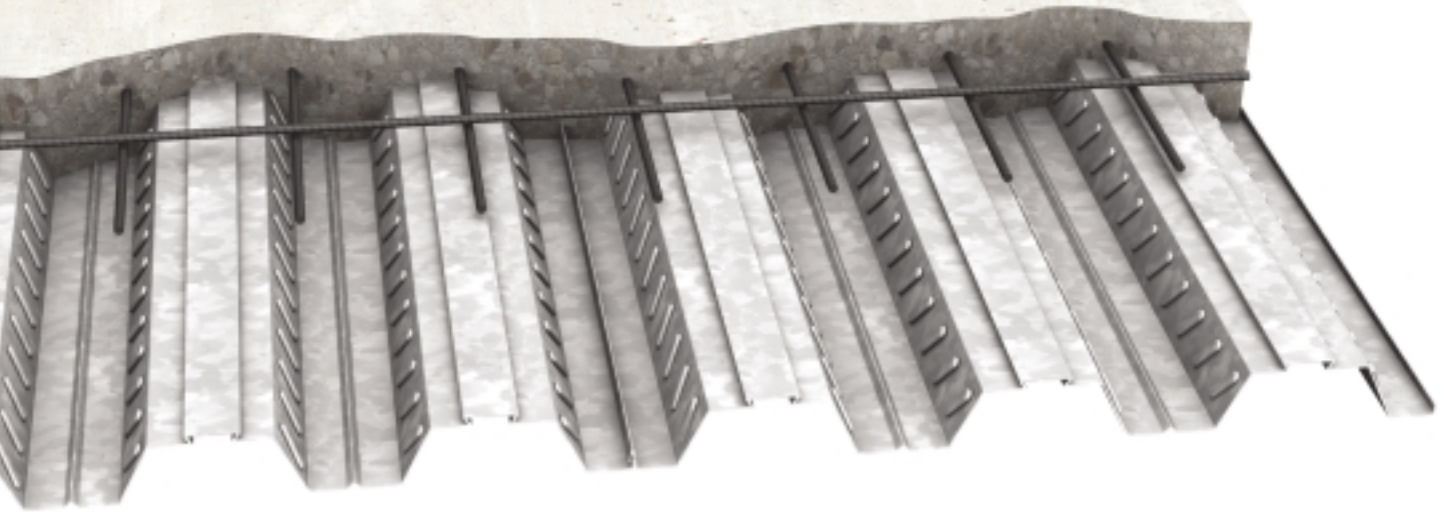
#### 1.5 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 1.1mm							Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
130	3.22	2.86	2.72	2.52	2.39	2.22	2.06	3.25	2.90	2.76	2.56	2.43	2.26	2.11
140	3.54	3.15	2.99	2.75	2.61	2.39	2.22	3.55	3.18	3.03	2.79	2.65	2.43	2.25
150	3.85	3.42	3.22	2.97	2.77	2.54	2.36	3.88	3.46	3.27	3.00	2.83	2.59	2.41
160	4.15	3.67	3.46	3.14	2.94	2.70	2.51	4.18	3.71	3.50	3.18	2.98	2.74	2.55
170	4.43	3.87	3.64	3.29	3.09	2.84	2.65	4.48	3.94	3.72	3.37	3.16	2.90	2.71
180	4.71	4.09	3.83	3.47	3.26	3.00	2.79	4.75	4.15	3.89	3.53	3.31	3.05	2.84
190	4.97	4.29	4.02	3.66	3.44	3.17	2.96	5.03	4.36	4.08	3.72	3.49	3.22	3.00
200	5.21	4.47	4.18	3.81	3.59	3.31	3.09	5.25	4.53	4.25	3.86	3.64	3.36	3.13
210	5.43	4.65	4.36	3.98	3.75	3.46	3.23	5.47	4.71	4.43	4.04	3.80	3.51	3.28
220	5.65	4.85	4.56	4.17	3.93	3.63	3.40	5.70	4.90	4.60	4.21	3.97	3.67	3.43
230	5.84	5.03	4.74	4.33	4.09	3.79	3.54	5.87	5.06	4.76	4.36	4.11	3.81	3.56
240	6.01	5.20	4.90	4.50	4.25	3.93	3.68	6.04	5.23	4.93	4.52	4.27	3.96	3.70
250	6.13	5.32	5.02	4.61	4.36	4.04	3.79	6.23	5.40	5.10	4.68	4.43	4.11	3.85

**Notes:**

These tables are not applicable to slabs where the deck is supplied in single span lengths (use Multideck Design software to determine suitable bottom bar requirements)

# Multideck 80-V2 Features and Applications



## Multideck 80-V2

Multideck 80-V2 is designed to incorporate all the advantages of the Multideck 60-V2 but in a deeper profile to provide longer spans up to 5.4m unpropped.

- **Concrete Volume Savings**

Due to its unique profile Multideck 80-V2 requires less concrete than other decks to achieve any given slab thickness.

- **Quicker Installation**

The Multideck range has a wider standard cover width requiring fewer panels and sidelaps. No temporary supports required under most conditions. A wide range of accessories allows for easy installation of ceilings and services.

- **Value for Money**

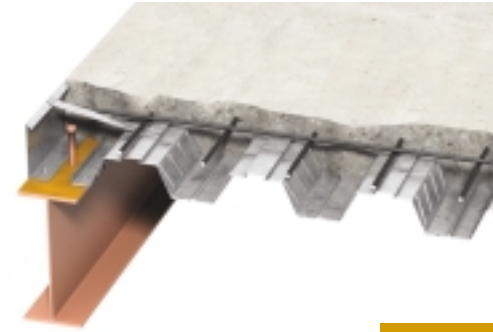
Bulk steel buying by Kingspan ensures a quality product at the right price.

- **Technical Support**

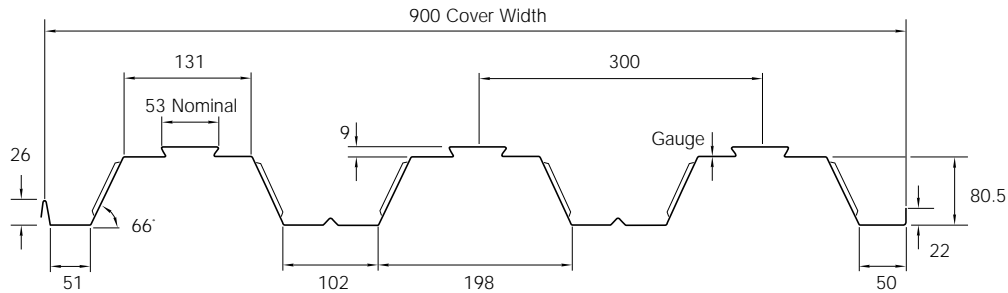
The Multideck technical department provides a comprehensive design and advisory service to specifiers and end users. Further details are also available on the Kingspan Toolkit Software.



# Multideck 80-V2 Specification and Design



## Profile and Dimensions (mm)



Gauge = 1.0, 1.1 & 1.2mm

Maximum length: 12 metres

## Section Properties per Metre Width

Normal Thickness (mm)	Self Weight		Height to Neutral Axis	Second Moment of Area (cm <sup>4</sup> /m)	Steel Area (mm <sup>2</sup> /m)	Ultimate Moment Capacity (kNm/m)	
	(kg/m <sup>2</sup> )	(kN/m <sup>2</sup> )	Sagging			Sagging	Hogging
1.00	11.49	0.113	42.50 mm	171.3	1413.00	12.62	9.94
1.10	12.64	0.124	43.10 mm	190.6	1560.00	14.39	11.33
1.20	13.83	0.136	45.00 mm	208.6	1705.33	16.42	12.73

## Material Specification - 350N/mm<sup>2</sup> Steel

Steel strip for Multideck 80-V2 complies with BS EN 10143 and BS EN 10147 with a guaranteed minimum yield strength of 350N/mm<sup>2</sup> and a minimum total coating mass (including both sides) of 275g/m<sup>2</sup>.

## Concrete Volumes & Specification

Load/span tables are based on Grade 30 concrete, having a design strength of 30N/mm<sup>2</sup>.

Density of normal weight concrete: 2400kg/m<sup>3</sup> at wet stage.

Density of lightweight concrete: 1900kg/m<sup>3</sup> at wet stage.

All concrete used with Multideck in the construction of composite slabs should comply with the recommendations in BS 8110: 1997.

## Volume & Weight of Composite Slabs

Slab Depth (mm)	Concrete Volume (m <sup>3</sup> /m <sup>2</sup> )	Weight (kN/m <sup>2</sup> )			
		Normal weight Concrete		Lightweight Concrete	
		Wet	Dry	Wet	Dry
130	0.082	1.984	1.944	1.577	1.496
140	0.092	2.220	2.174	1.764	1.672
150	0.102	2.455	2.405	1.950	1.849
160	0.112	2.691	2.635	2.136	2.026
175	0.127	3.044	2.981	2.416	2.290
200	0.152	3.633	3.557	2.882	2.732
250	0.202	4.810	4.710	3.814	3.615

### Notes:

- 1 Important - Concrete volumes do not take into account deflection.
- 2 Excludes weight of steel decking and relates only to weight of concrete.
- 3 Concrete volumes are based upon a calculated minimum value. (Nominal slab depth)  
Account should be taken of deck and supporting structure deflections.



Multideck was used in the construction of Omagh College, Co. Tyrone.  
Photo Courtesy of Composite Design Ireland Ltd.



# Multideck 80-V2 Load Tables (Notes)


When using load tables for Multideck 80-V2 please take into consideration the following notes:

- 1 All tabulated figures include the self weight of the slab.
- 2 All tabulated figures include a construction allowance of 1.5kN/m<sup>2</sup> and for spans less than 3m construction allowance is 4.5/span.
- 3 The suggested maximum ratios of slab span to slab depth are 30 for LWC and 35 for NWC to control deflections. Deflection under construction loading (wet concrete etc.) has been limited to that stipulated in BS 5950: Part 4 1994.
- 4 Minimum reinforcement mesh sizes provide 0.1% of the gross cross-sectional area of the concrete at the support.
- 5 The composite slabs should meet the requirements of BS 5950: Part 4 1994 with regard to their composite behaviour under normal imposed loads.
- 6 Total applied load referred to in the load tables is a working load based on factored combinations of live loads, finishes, ceilings, services and partitions, divided by a load factor of 1.60 (excluding slab self weight).
- 7 Temporary supports should remain in place until the concrete has achieved its 75% of its 28 day cube strength often available after 7 days.
- 8 Where ★ appears the addition of props gives no further benefit in these cases.
- 9 Propped loads assume props are equally spaced.
- 10 Deck must lie flat on all support beams. Point only contact will affect design loading.
- 11 Where figures in **red** appear this shows the maximum permissible spans in situations where there is one stud per trough.
- 12 Span values are based on 100mm minimum support widths.
- 13 Construction stage spans are generally noted under the 4.0 kN/m<sup>2</sup> loads and shaded. For confirmation of maximum unpropped spans see page 65.

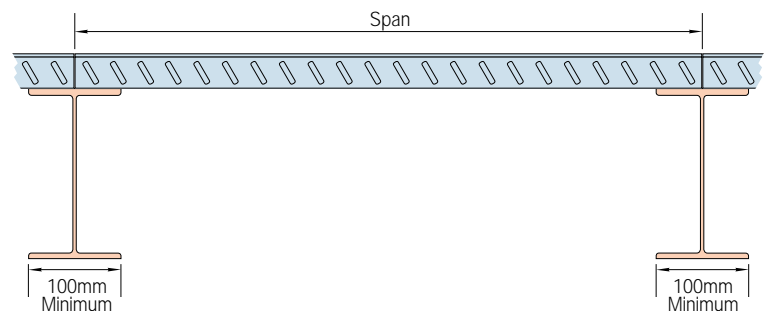


Multideck 80-V2



 **Tip:** Use the Kingspan Toolkit CD with Word output to save time on your structural calculations.

## Definition of Span (Construction Stage) When Using Kingspan Load Tables



### Support widths greater than 100mm?

The span capacities shown on the following pages can be increased by the difference between the actual support widths and 100mm.

### Example

Support widths 140mm and 200mm.

Span values can be increased by  $(140 + 200)/2 - 100 = 70$ mm.

MD80-V2 1.2mm double span deck (no props).

150mm thick slab- normal weight concrete.

Construction stage span from page 29.

4.0kN/m<sup>2</sup> load column = 4810mm.

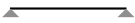

with support widths of 140 and 200 the increased span capacity is  $4810 + 70 = 4880$ mm.

# Multideck 80-V2

## Normal Weight Concrete Load Tables



### Unpropped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 27)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.0					
			Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0
	130	A142	4.03	3.90	3.70	3.28	2.98	2.75
	140	A142	3.93	3.93	3.92	3.48	3.16	2.91
					3.93	3.86	3.51	3.24
	150	A142	3.84	3.84	3.84	3.66	3.32	3.06
						3.84	3.70	3.41
	160	A142	3.75	3.75	3.75	3.75	3.49	3.21
							3.75	3.58
175	A142	3.65	3.65	3.65	3.65	3.65	3.42	
							3.65	
200	A193	3.45	3.45	3.45	3.45	3.45	3.45	
250	A252	3.16	3.16	3.16	3.16	3.16	3.16	
	130	A142	4.53	4.31	3.70	3.28	2.98	2.75
	140	A142	4.39	4.39	3.92	3.48	3.16	2.91
					4.29	3.86	3.51	3.24
	150	A142	4.26	4.26	4.13	3.66	3.32	3.06
					4.26	4.08	3.70	3.41
	160	A142	4.15	4.15	4.15	3.84	3.49	3.21
						4.15	3.89	3.58
175	A142	3.99	3.99	3.99	3.99	3.72	3.42	
						3.99	3.82	
200	A193	3.76	3.76	3.76	3.76	3.76	3.75	
							3.76	
250	A252	3.40	3.40	3.40	3.40	3.40	3.40	

### Propped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 27)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.0					
			Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0
	130	A142	★	★	★	★	★	★
	140	A142	4.56	★	★	★	★	★
			4.90					
	150	A142	4.73	★	★	★	★	★
			5.25	4.52				
	160	A142	4.87	4.21	★	★	★	★
			5.42	4.69	4.19			
175	A142	5.08	4.41	★	★	★	★	
		5.65	4.91	4.40	4.02			
200	A193	5.36	4.70	4.22	3.87	★	★	
		5.98	5.24	4.72	4.33	4.02		
250	A252	5.81	5.16	4.68	4.31	4.02	3.78	
		6.49	5.77	5.24	4.83	4.51	4.24	
	200	A193	★	★	★	★	★	★
	250	A252	★	★	★	★	★	★

#### Notes:

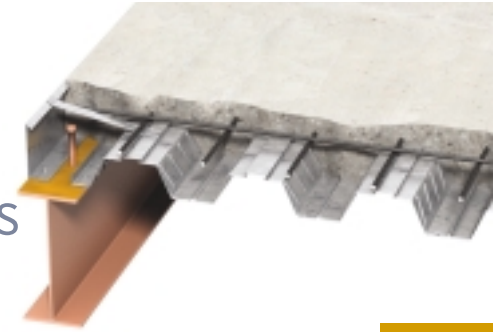
Total applied load referred to in the above table is a working load based on factored combinations of live loads, finishes, ceilings, services and partitions, divided by a load factor of 1.60 (excluding slab self weight).

Figures in red are maximum permissible spans in situations where there is one stud per trough.

Permanent Support ▲ Temporary Support ↑

# Multideck 80-V2

## Normal Weight Concrete Load Tables



### Unpropped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 27)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.1mm						Gauge = 1.2mm						
			Total Applied Load (kN/m <sup>2</sup> ) SLS												
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0	
	130	A142	4.13	3.93	3.86	3.43	3.11	2.87	4.22	3.95	3.90	3.53	3.21	2.96	
	140	A142	4.03	4.03	4.03	3.63	3.30	3.04	4.11	4.11	4.11	3.75	3.40	3.14	
						3.99	3.63	3.34				4.08	3.71	3.42	
	150	A142	3.93	3.93	3.93	3.83	3.47	3.20	4.02	4.02	4.02	3.95	3.59	3.31	
						3.93	3.83	3.53				4.02	3.92	3.61	
	160	A142	3.85	3.85	3.85	3.85	3.64	3.36	3.93	3.93	3.93	3.93	3.77	3.47	
							3.85	3.70					3.93	3.80	
	175	A142	3.74	3.74	3.74	3.74	3.74	3.58	3.82	3.82	3.82	3.82	3.82	3.70	
								3.74						3.82	
	200	A193	3.58	3.58	3.58	3.58	3.58	3.58	3.66	3.66	3.66	3.66	3.66	3.66	
	250	A252	3.27	3.27	3.27	3.27	3.27	3.27	3.37	3.37	3.37	3.37	3.37	3.37	
	130	A142	4.55	4.50	3.86	3.43	3.11	2.87	4.55	4.55	3.98	3.53	3.21	2.96	
	140	A142	4.68	4.68	4.09	3.63	3.30	3.04	4.90	4.90	4.22	3.75	3.40	3.14	
					4.44	3.99	3.63	3.34				4.53	4.08	3.71	3.42
	150	A142	4.54	4.54	4.31	3.83	3.47	3.20	4.81	4.81	4.45	3.95	3.59	3.31	
					4.54	4.21	3.83	3.53				4.73	4.31	3.92	3.61
	160	A142	4.42	4.42	4.42	4.01	3.64	3.36	4.68	4.68	4.67	4.15	3.77	3.47	
						4.42	4.02	3.70				4.68	4.53	4.12	3.80
	175	A142	4.25	4.25	4.25	4.25	3.88	3.58	4.50	4.50	4.50	4.43	4.02	3.70	
							4.25	3.95				4.50	4.40	4.06	
	200	A193	4.01	4.01	4.01	4.01	4.01	3.92	4.24	4.24	4.24	4.24	4.24	4.06	
								4.01						4.24	
	250	A252	3.62	3.62	3.62	3.62	3.62	3.62	3.84	3.84	3.84	3.84	3.84	3.84	

### Propped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 27)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.1mm						Gauge = 1.2mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS											
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	130	A142	★	★	★	★	★	★	★	★	★	★	★	★
	140	A142	4.76	★	★	★	★	★	★	★	★	★	★	★
			4.90											
	150	A142	4.93	★	★	★	★	★	5.08	★	★	★	★	★
			5.25	4.67					5.25					
	160	A142	5.08	★	★	★	★	★	5.24	★	★	★	★	★
			5.59	4.84					5.60	4.95				
	175	A142	5.29	4.60	★	★	★	★	5.47	4.75	★	★	★	★
			5.84	5.08	4.55			5.97	5.20	4.66				
	200	A193	5.59	4.90	4.41	4.04	★	★	5.78	5.07	4.57	★	★	★
			6.18	5.42	4.88	4.47	4.15	6.33	5.56	5.01	4.59	4.26		
	250	A252	6.06	5.38	4.89	4.51	4.20	3.95	6.27	5.58	5.07	4.67	4.35	4.09
			6.71	5.96	5.42	5.00	4.66	4.36	6.89	6.13	5.57	5.14	4.79	4.51
	200	A193	★	★	★	★	★	★	★	★	★	★	★	★
	250	A252	★	★	★	★	★	★	★	★	★	★	★	★

#### Notes:

Total applied load referred to in the above table is a working load based on factored combinations of live loads, finishes, ceilings, services and partitions, divided by a load factor of 1.60 (excluding slab self weight).

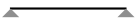

Figures in red are maximum permissible spans in situations where there is one stud per trough.

Permanent Support ▲ Temporary Support ↑

# Multideck 80-V2 Lightweight Concrete Load Tables



## Unpropped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 27)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.0					
			Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0
	130 LWC	A142	4.19	3.66	3.32	3.25	2.98	2.75
	140 LWC	A142	4.14	3.90	3.55	3.48	3.16	2.91
	150 LWC	A142	4.05	4.05	3.77	3.66	3.32	3.06
	160 LWC	A142	3.96	3.96	3.96	3.84	3.49	3.21
	175 LWC	A142	3.85	3.85	3.85	3.85	3.72	3.42
	200 LWC	A193	3.69	3.69	3.69	3.69	3.69	3.69
	250 LWC	A252	3.40	3.40	3.40	3.40	3.40	3.40
	130 LWC	A142	4.19	3.90	3.70	3.28	2.98	2.75
	140 LWC	A142	4.47	4.20	3.92	3.48	3.16	2.91
	150 LWC	A142	4.55	4.50	4.13	3.66	3.32	3.06
	160 LWC	A142	4.44	4.44	4.33	3.84	3.49	3.21
	175 LWC	A142	4.28	4.28	4.28	4.10	3.72	3.42
	200 LWC	A193	4.06	4.06	4.06	4.06	4.06	3.75
	250 LWC	A252	3.70	3.70	3.70	3.70	3.70	3.70

## Propped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 27)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.0					
			Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0
	130 LWC	A142	★	★	★	★	★	★
	140 LWC	A142	★	★	★	★	★	★
	150 LWC	A142	4.65	★	★	★	★	★
	160 LWC	A142	4.89	★	★	★	★	★
	175 LWC	A142	5.25	4.58	★	★	★	★
	200 LWC	A193	5.68	4.91	4.38	★	★	★
	250 LWC	A252	6.22	5.44	4.89	4.48	4.15	3.76
	200 LWC	A193	★	★	★	★	★	★
	250 LWC	A252	★	★	★	★	★	★

### Notes:

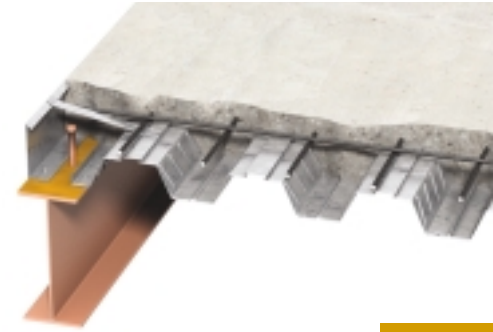
Total applied load referred to in the above table is a working load based on factored combinations of live loads, finishes, ceilings, services and partitions, divided by a load factor of 1.60 (excluding slab self weight).

Figures in red are maximum permissible spans in situations where there is one stud per trough.

Permanent Support ▲ Temporary Support ↑

# Multideck 80-V2

## Lightweight Concrete Load Tables



### Unpropped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 27)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.1mm						Gauge = 1.2mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS						Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	130 LWC A142	A142	4.25	3.71	3.37	3.25	3.11	2.87	4.28	3.73	3.39	3.25	3.21	2.96
	140 LWC A142	A142	4.25	3.96	3.60	3.50	3.30	3.04	4.34	3.98	3.62	3.50	3.40	3.14
	150 LWC A142	A142	4.15	4.15	3.82	3.75	3.47	3.20	4.24	4.23	3.85	3.75	3.59	3.31
	160 LWC A142	A142	4.06	4.06	4.06	4.00	3.64	3.36	4.15	4.15	4.08	4.00	3.77	3.47
	175 LWC A142	A142	3.95	3.95	3.95	3.95	3.88	3.58	4.03	4.03	4.03	4.03	4.02	3.70
	200 LWC A193	A193	3.79	3.79	3.79	3.79	3.79	3.79	3.87	3.87	3.87	3.87	3.87	3.87
	250 LWC A252	A252	3.52	3.52	3.52	3.52	3.52	3.52	3.62	3.62	3.62	3.62	3.62	3.62
	130 LWC A142	A142	4.25	3.90	3.86	3.43	3.11	2.87	4.28	3.90	3.90	3.53	3.21	2.96
	140 LWC A142	A142	4.53	4.20	4.09	3.63	3.30	3.04	4.56	4.20	4.20	3.75	3.40	3.14
	150 LWC A142	A142	4.82	4.50	4.31	3.83	3.47	3.20	4.85	4.50	4.45	3.95	3.59	3.31
	160 LWC A142	A142	4.73	4.73	4.52	4.01	3.64	3.36	5.00	4.80	4.67	4.15	3.77	3.47
	175 LWC A142	A142	4.56	4.56	4.56	4.28	3.88	3.58	4.83	4.83	4.83	4.43	4.02	3.70
	200 LWC A193	A193	4.32	4.32	4.32	4.32	4.26	3.92	4.58	4.58	4.58	4.58	4.41	4.06
	250 LWC A252	A252	3.94	3.94	3.94	3.94	3.94	3.94	4.17	4.17	4.17	4.17	4.17	4.17

### Propped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 27)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.1mm						Gauge = 1.2mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS						Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	130 LWC A142	A142	★	★	★	★	★	★	★	★	★	★	★	★
	140 LWC A142	A142	★	★	★	★	★	★	★	★	★	★	★	★
	150 LWC A142	A142	★	★	★	★	★	★	★	★	★	★	★	★
	160 LWC A142	A142	4.95	★	★	★	★	★	★	★	★	★	★	★
	175 LWC A142	A142	5.31	4.78	★	★	★	★	5.33	4.94	★	★	★	★
	200 LWC A193	A193	5.92	5.12	4.57	★	★	★	6.00	5.30	4.73	★	★	★
	250 LWC A252	A252	6.49	5.68	5.11	4.68	4.34	★	6.71	5.88	5.29	4.85	4.50	★
	200 LWC A193	A193	★	★	★	★	★	★	★	★	★	★	★	
	250 LWC A252	A252	★	★	★	★	★	★	★	★	★	★	★	

#### Notes:

Total applied load referred to in the above table is a working load based on factored combinations of live loads, finishes, ceilings, services and partitions, divided by a load factor of 1.60 (excluding slab self weight).

Figures in red are maximum permissible spans in situations where there is one stud per trough.

Permanent Support ▲ Temporary Support ↑

Multideck 80-V2

# Multideck 80-V2 Fire Performance

## Fire Performance

- 1 The fire resistance tables for Multideck 80-V2 following are based upon fire test data from full scale tests performed at the Warrington Fire Research Centre, April 1991.
- 2 All stated slab depths comply with the minimum fire insulation criteria of BS 476: Part 20 1987.
- 3 The composite slab is assumed to be continuous over one or more intermediate supports. i.e. minimum double span.

- 4 The fire resistance load tables are for continuous spans only with no propping. For 2 hour fire rating or propped and single span conditions use the Kingspan Toolkit Software or contact Kingspan Technical Services.
- 5 Minimum laps should be 300mm for A142 mesh and 400mm for A193 and A252 mesh.
- 6 The mesh should be placed between 20 & 40mm from the upper surface of the slab. (This range caters for lap areas.)
- 7 The tables are based upon Grade 30 concrete, reinforcement having a yield strength of 460N/mm<sup>2</sup>.
- 8 The tables must be read in conjunction with load/span tables for Multideck 80-V2 to verify the structural integrity of the composite slab.
- 9 The values in all the tables are relevant to unpropped construction.
- 10 The tables take into account the reduced partial factor of 0.8 as permitted in BS 5950: Part 8 for non-permanent imposed loads. The tables are presented in terms of total specified imposed load (non-permanent and permanent). It is assumed that the permanent imposed loads for partitions, finishes, ceilings and services are equivalent to 1.7kN/m<sup>2</sup> in all cases. The tables are therefore appropriate for office type applications.

For other applications where the imposed loads are almost entirely permanent the total load should be adjusted accordingly before reading from the tables,

eg:

150mm normal weight concrete plantroom slab and A142 mesh  
7.5kN/m<sup>2</sup> live load

1.2kN/m<sup>2</sup> 50mm screed finish 0.5kN/m<sup>2</sup> ceilings and services  
1 hour fire rating

**Multideck 80-V2 profile**

**Total applied load =  $1.2 + 0.5 + 7.5/0.8 = 11.075\text{kN/m}^2$**

**From table opposite maximum span = 3.16m.**

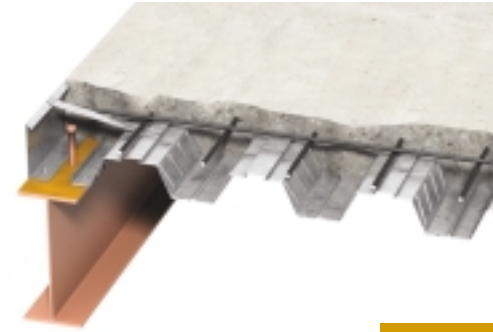
- 11 The \* denotes that the mesh provided, although satisfying the fire resistance requirement, does not comply with the minimum anti-crack reinforcement requirement of BS 5950: Part 4.  
Refer to standard load/span tables for minimum mesh requirements.
- 12 For load span conditions beyond the scope of these tables the Kingspan Toolkit Software should be used which includes the Fire Engineering Method as detailed in the SCI Publication 056.  
See following pages for Multideck 80-V2 Fire Resistance Tables.





# Multideck 80-V2

## Fire Resistance Load Tables



### Normal Weight Concrete

Span (m)

Slab Depth (mm)	Min Mesh Size	Fire rating: 1.0 hour										Fire rating: 1.5 hours									
		Total Applied Load (kN/m <sup>2</sup> )										Total Applied Load (kN/m <sup>2</sup> )									
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00		
140	A142	4.09	3.85	3.65	3.48	3.34	3.21	3.09	2.99	2.90	-	-	-	-	-	-	-	-	-		
140	A193	4.37	4.12	3.91	3.73	3.57	3.44	3.31	3.20	3.10	-	-	-	-	-	-	-	-	-		
140	A252	4.67	4.40	4.17	3.97	3.81	3.67	3.53	3.41	3.30	-	-	-	-	-	-	-	-	-		
150	A142	4.29	4.05	3.85	3.67	3.52	3.39	3.27	3.17	3.07	3.60	3.40	3.23	3.08	2.96	2.85	2.75	2.66	2.58		
150	A193	4.60	4.35	4.13	3.94	3.78	3.64	3.51	3.40	3.29	3.90	3.68	3.50	3.34	3.21	3.09	2.98	2.88	2.79		
150	A252	4.93	4.65	4.42	4.21	4.04	3.89	3.75	3.63	3.52	4.21	3.97	3.77	3.60	3.46	3.33	3.21	3.11	3.01		
160	A142	4.45	4.21	4.00	3.83	3.67	3.54	3.42	3.31	3.21	3.79	3.58	3.41	3.25	3.13	3.02	2.91	2.82	2.74		
160	A193	4.79	4.53	4.31	4.11	3.95	3.81	3.67	3.56	3.45	4.11	3.89	3.70	3.54	3.40	3.28	3.16	3.06	2.97		
160	A252	5.14	4.86	4.62	4.42	4.24	4.09	3.94	3.82	3.70	4.45	4.21	4.00	3.83	3.67	3.54	3.42	3.31	3.21		
175	A142	4.54	4.31	4.11	3.94	3.78	3.65	3.52	3.42	3.32	3.99	3.79	3.61	3.46	3.32	3.21	3.10	3.01	2.92		
175	A193	4.89	4.64	4.43	4.23	4.07	3.93	3.79	3.68	3.57	4.35	4.13	3.94	3.77	3.62	3.50	3.38	3.28	3.18		
175	A252	5.25	4.98	4.74	4.52	4.36	4.21	4.06	3.94	3.82	4.71	4.47	4.26	4.08	3.92	3.78	3.65	3.54	3.43		
200	*A142	4.67	4.45	4.25	4.08	3.93	3.80	3.68	3.57	3.47	4.12	3.93	3.76	3.60	3.48	3.36	3.25	3.16	3.07		
200	A193	5.02	4.78	4.57	4.38	4.23	4.09	3.95	3.83	3.72	4.50	4.28	4.10	3.93	3.79	3.66	3.54	3.44	3.34		
200	A252	5.38	5.12	4.89	4.69	4.52	4.37	4.23	4.11	3.99	4.88	4.64	4.44	4.26	4.11	3.97	3.84	3.73	3.62		
250	*A142	4.86	4.65	4.47	4.31	4.17	4.04	3.92	3.82	3.72	4.27	4.09	3.93	3.79	3.67	3.56	3.45	3.36	3.27		
250	*A193	5.21	4.99	4.80	4.62	4.47	4.33	4.20	4.09	3.98	4.65	4.45	4.28	4.12	3.99	3.87	3.75	3.65	3.56		
250	A252	5.57	5.33	5.13	4.94	4.78	4.63	4.49	4.37	4.26	5.03	4.82	4.64	4.47	4.32	4.19	4.06	3.95	3.85		

Multideck 80-V2

### Lightweight Concrete

Span (m)

Slab Depth (mm)	Min Mesh Size	Fire rating: 1.0 hour										Fire rating: 1.5 hours									
		Total Applied Load (kN/m <sup>2</sup> )										Total Applied Load (kN/m <sup>2</sup> )									
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00		
130 LWC	A142	3.90	3.83	3.61	3.43	3.27	3.14	3.02	2.92	2.82	-	-	-	-	-	-	-	-	-		
130 LWC	A193	3.90	3.90	3.87	3.67	3.50	3.36	3.23	3.12	3.01	-	-	-	-	-	-	-	-	-		
130 LWC	A252	3.90	3.90	3.90	3.87	3.74	3.59	3.44	3.32	3.21	-	-	-	-	-	-	-	-	-		
140 LWC	A142	4.20	4.09	3.86	3.66	3.50	3.36	3.23	3.12	3.02	3.73	3.49	3.30	3.14	3.00	2.88	2.77	2.68	2.59		
140 LWC	A193	4.20	4.20	4.15	3.94	3.77	3.62	3.48	3.36	3.25	4.06	3.80	3.59	3.42	3.26	3.13	3.01	2.91	2.81		
140 LWC	A252	4.20	4.20	4.20	4.17	4.03	3.87	3.72	3.59	3.47	4.20	4.11	3.88	3.68	3.52	3.38	3.25	3.14	3.04		
150 LWC	A142	4.50	4.29	4.06	3.86	3.69	3.55	3.41	3.30	3.19	3.97	3.73	3.53	3.36	3.21	3.09	2.97	2.87	2.78		
150 LWC	A193	4.50	4.50	4.37	4.16	3.97	3.82	3.67	3.55	3.43	4.34	4.07	3.85	3.66	3.50	3.37	3.24	3.13	3.03		
150 LWC	A252	4.50	4.50	4.50	4.44	4.27	4.10	3.94	3.81	3.68	4.50	4.42	4.18	3.97	3.80	3.65	3.51	3.39	3.28		
160 LWC	A142	4.71	4.43	4.20	4.00	3.83	3.68	3.54	3.42	3.31	4.17	3.92	3.72	3.54	3.39	3.26	3.14	3.04	2.94		
160 LWC	A193	4.80	4.79	4.54	4.32	4.13	3.98	3.83	3.70	3.58	4.57	4.30	4.07	3.87	3.71	3.57	3.43	3.32	3.21		
160 LWC	A252	4.80	4.80	4.80	4.64	4.44	4.27	4.11	3.97	3.84	4.80	4.67	4.42	4.21	4.03	3.88	3.73	3.61	3.49		
175 LWC	*A142	4.81	4.53	4.30	4.11	3.93	3.79	3.65	3.54	3.42	4.30	4.05	3.85	3.67	3.52	3.39	3.26	3.16	3.06		
175 LWC	A193	5.16	4.90	4.65	4.43	4.25	4.09	3.94	3.81	3.69	4.71	4.44	4.22	4.02	3.86	3.72	3.58	3.46	3.35		
175 LWC	A252	5.25	5.20	4.99	4.76	4.56	4.39	4.23	4.09	3.96	5.13	4.84	4.60	4.38	4.20	4.04	3.89	3.77	3.65		
200 LWC	*A142	4.96	4.70	4.47	4.27	4.11	3.96	3.82	3.70	3.59	4.41	4.18	3.98	3.80	3.65	3.52	3.40	3.29	3.19		
200 LWC	A193	5.35	5.06	4.82	4.61	4.42	4.26	4.11	3.98	3.86	4.83	4.57	4.35	4.16	4.00	3.86	3.72	3.60	3.49		
200 LWC	A252	5.74	5.43	5.17	4.94	4.74	4.57	4.41	4.27	4.14	5.26	4.98	4.74	4.53	4.35	4.19	4.04	3.92	3.80		
250 LWC	*A142	5.20	4.95	4.74	4.54	4.38	4.24	4.10	3.98	3.86	4.59	4.38	4.19	4.02	3.87	3.74	3.62	3.52	3.42		
250 LWC	*A193	5.59	5.32	5.09	4.88	4.71	4.55	4.40	4.27	4.15	5.02	4.78	4.57	4.39	4.23	4.09	3.95	3.84	3.73		
250 LWC	A252	5.98	5.69	5.45	5.23	5.04	4.87	4.71	4.57	4.44	5.45	5.19	4.96	4.76	4.59	4.44	4.29	4.17	4.05		

# Multideck 80-V2

## Fire Resistance Load Tables

### Dramix<sup>®</sup> Reinforced Concrete (20kg/m<sup>3</sup> RC-80/60-BN)

#### 1 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)						
	Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0
150	4.96	4.16	3.88	3.52	3.31	3.05	2.84
160	5.09	4.30	4.02	3.66	3.44	3.17	2.96
170	5.20	4.42	4.15	3.78	3.56	3.29	3.07
180	5.31	4.55	4.27	3.91	3.68	3.41	3.19
190	5.41	4.66	4.39	4.02	3.80	3.52	3.29
200	5.52	4.77	4.50	4.13	3.90	3.62	3.39
210	5.62	4.88	4.61	4.24	4.02	3.73	3.49
220	5.72	5.00	4.73	4.36	4.13	3.84	3.60
230	5.82	5.11	4.84	4.47	4.23	3.94	3.70
240	5.92	5.21	4.95	4.57	4.34	4.05	3.80
250	6.01	5.31	5.05	4.68	4.45	4.15	3.91

#### 1.5 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)						
	Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0
160	3.95	3.34	3.13	2.84	2.68	2.47	2.31
170	4.07	3.47	3.25	2.97	2.80	2.59	2.41
180	4.20	3.59	3.38	3.09	2.92	2.70	2.53
190	4.32	3.73	3.51	3.21	3.04	2.81	2.63
200	4.45	3.85	3.63	3.34	3.16	2.93	2.75
210	4.55	3.96	3.74	3.45	3.27	3.03	2.84
220	4.67	4.09	3.87	3.56	3.38	3.14	2.95
230	4.77	4.19	3.97	3.66	3.48	3.23	3.05
240	4.88	4.30	4.08	3.77	3.59	3.34	3.15
250	4.98	4.41	4.19	3.88	3.69	3.45	3.24

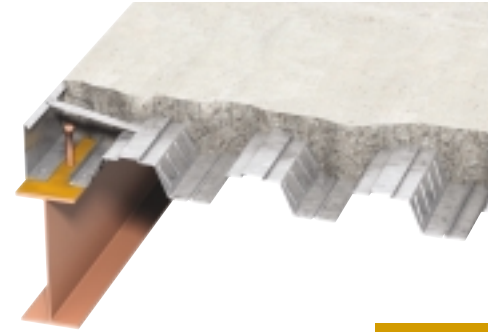
#### Notes:

These tables are not applicable to slabs where the deck is supplied in single span lengths (use Multideck Design software to determine suitable bottom bar requirements)

# Multideck 80-V2

## Fire Resistance Load Tables

### Dramix® Reinforced Concrete (20kg/m<sup>3</sup> RC-80/60-BN)



Multideck 80-V2

#### 1 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 1.1mm							Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
150	5.14	4.31	4.03	3.66	3.43	3.16	2.95	5.31	4.45	4.16	3.77	3.55	3.27	3.04
160	5.26	4.45	4.16	3.78	3.55	3.28	3.06	5.43	4.59	4.30	3.91	3.67	3.39	3.16
170	5.38	4.57	4.29	3.91	3.68	3.40	3.17	5.55	4.73	4.43	4.04	3.80	3.52	3.28
180	5.49	4.70	4.42	4.04	3.80	3.52	3.29	5.66	4.85	4.55	4.16	3.93	3.63	3.40
190	5.59	4.81	4.53	4.15	3.92	3.63	3.40	5.77	4.97	4.67	4.28	4.04	3.74	3.50
200	5.70	4.93	4.65	4.27	4.03	3.74	3.51	5.87	5.08	4.79	4.40	4.16	3.85	3.61
210	5.80	5.04	4.76	4.38	4.14	3.84	3.61	5.97	5.19	4.90	4.51	4.27	3.96	3.71
220	5.90	5.15	4.88	4.49	4.25	3.95	3.71	6.07	5.30	5.02	4.63	4.38	4.07	3.82
230	5.99	5.26	4.98	4.60	4.36	4.06	3.81	6.17	5.41	5.13	4.73	4.49	4.18	3.93
240	6.09	5.37	5.09	4.71	4.47	4.16	3.91	6.26	5.52	5.23	4.84	4.59	4.28	4.02
250	6.18	5.47	5.20	4.81	4.57	4.27	4.02	6.34	5.61	5.33	4.94	4.70	4.38	4.13

#### 1.5 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 1.1mm							Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
160	4.08	3.45	3.23	2.94	2.77	2.55	2.38	4.20	3.55	3.32	3.02	2.84	2.63	2.45
170	4.19	3.57	3.35	3.05	2.88	2.66	2.48	4.32	3.68	3.45	3.15	2.97	2.74	2.56
180	4.32	3.70	3.48	3.18	3.00	2.78	2.60	4.45	3.81	3.58	3.27	3.09	2.86	2.68
190	4.43	3.81	3.59	3.29	3.11	2.88	2.70	4.55	3.93	3.70	3.39	3.20	2.97	2.78
200	4.56	3.95	3.73	3.42	3.23	3.01	2.82	4.67	4.05	3.82	3.51	3.31	3.08	2.88
210	4.66	4.06	3.84	3.53	3.34	3.11	2.91	4.77	4.16	3.93	3.62	3.42	3.18	2.98
220	4.78	4.18	3.95	3.65	3.45	3.22	3.02	4.88	4.27	4.04	3.72	3.52	3.28	3.08
230	4.89	4.29	4.07	3.76	3.56	3.32	3.12	4.99	4.38	4.16	3.84	3.64	3.39	3.19
240	4.99	4.40	4.18	3.87	3.67	3.42	3.22	5.09	4.49	4.26	3.95	3.74	3.49	3.28
250	5.09	4.50	4.28	3.97	3.77	3.52	3.31	5.19	4.59	4.37	4.05	3.84	3.59	3.38

**Notes:**

These tables are not applicable to slabs where the deck is supplied in single span lengths (use Multideck Design software to determine suitable bottom bar requirements)

# Multideck 80-V2

## Fire Resistance Load Tables

### Dramix<sup>®</sup> Reinforced Concrete (20kg/m<sup>3</sup> RC-80/60-BN)

#### 1 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)						
	Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0
140	5.20	4.23	3.91	3.52	3.29	3.01	2.79
150	5.36	4.39	4.07	3.66	3.43	3.14	2.91
160	5.51	4.55	4.23	3.81	3.57	3.27	3.05
170	5.65	4.69	4.37	3.95	3.70	3.40	3.16
180	5.78	4.84	4.51	4.09	3.83	3.52	3.28
190	5.91	4.97	4.64	4.21	3.96	3.64	3.40
200	6.04	5.10	4.77	4.34	4.09	3.77	3.51
210	6.16	5.23	4.91	4.47	4.21	3.88	3.63
220	6.27	5.35	5.03	4.59	4.32	3.99	3.73
230	2.88	5.48	5.16	4.72	4.45	4.12	3.84
240	6.52	5.61	5.28	4.84	4.57	4.23	3.96
250	6.64	5.74	5.41	4.96	4.69	4.34	4.07

#### 1.5 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)						
	Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0
150	4.20	3.45	3.20	2.89	2.70	2.48	2.30
160	4.35	3.60	3.35	3.02	2.84	2.60	2.42
170	4.51	3.75	3.49	3.16	2.96	2.73	2.54
180	4.65	3.89	3.63	3.29	3.09	2.84	2.65
190	4.79	4.03	3.77	3.42	3.22	2.96	2.77
200	4.92	4.16	3.91	3.55	3.34	3.08	2.88
210	5.07	4.31	4.04	3.69	3.47	3.20	2.99
220	5.20	4.44	4.16	3.80	3.59	3.31	3.10
230	5.34	4.58	4.30	3.94	3.72	3.44	3.22
240	5.47	4.71	4.44	4.06	3.84	3.55	3.33
250	5.60	4.84	4.56	4.19	3.96	3.67	3.44

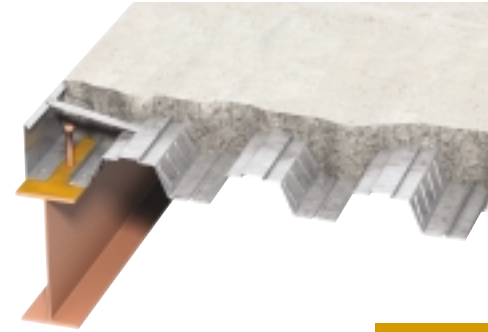
**Notes:**

These tables are not applicable to slabs where the deck is supplied in single span lengths (use Multideck Design software to determine suitable bottom bar requirements)

# Multideck 80-V2

## Fire Resistance Load Tables

### Dramix® Reinforced Concrete (20kg/m<sup>3</sup> RC-80/60-BN)



Multideck 80-V2

#### 1 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 1.1mm							Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
140	5.39	4.39	4.06	3.65	3.41	3.12	2.90	5.57	4.53	4.20	3.77	3.52	3.22	2.98
150	5.55	4.55	4.22	3.80	3.55	3.25	3.02	5.73	4.70	4.35	3.92	3.66	3.36	3.12
160	5.70	4.70	4.37	3.95	3.69	3.38	3.15	5.88	4.86	4.52	4.07	3.81	3.50	3.25
170	5.84	4.85	4.52	4.09	3.83	3.52	3.27	6.02	5.01	4.66	4.21	3.95	3.63	3.38
180	5.98	5.00	4.66	4.23	3.96	3.65	3.40	6.16	5.16	4.81	4.36	4.09	3.76	3.50
190	6.11	5.13	4.80	4.36	4.09	3.77	3.52	6.29	5.29	4.95	4.49	4.22	3.88	3.62
200	6.23	5.27	4.93	4.48	4.21	3.88	3.63	6.41	5.42	5.08	4.62	4.34	4.00	3.73
210	6.35	5.40	5.06	4.61	4.34	4.01	3.74	2.88	5.55	5.20	4.74	4.47	4.12	3.84
220	6.48	5.53	5.20	4.74	4.47	4.13	3.85	6.66	5.69	5.34	4.88	4.59	4.24	3.96
230	6.59	5.65	5.31	4.86	4.58	4.23	3.96	6.77	5.80	5.46	4.99	4.71	4.35	4.07
240	6.70	5.77	5.43	4.98	4.70	4.34	4.07	6.88	5.92	5.58	5.11	4.82	4.46	4.18
250	6.83	5.90	5.56	5.10	4.82	4.47	4.18	7.01	6.05	5.71	5.23	4.95	4.59	4.30

#### 1.5 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 1.1mm							Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
150	4.33	3.55	3.30	2.98	2.78	2.55	2.38	4.46	3.66	3.40	3.06	2.87	2.63	2.45
160	4.49	3.71	3.45	3.12	2.92	2.69	2.50	4.61	3.81	3.55	3.20	3.00	2.75	2.56
170	4.63	3.86	3.59	3.25	3.05	2.80	2.61	4.76	3.96	3.69	3.34	3.13	2.88	2.68
180	4.77	4.00	3.73	3.38	3.17	2.92	2.73	4.91	4.11	3.84	3.48	3.27	3.00	2.80
190	4.91	4.13	3.87	3.51	3.30	3.04	2.84	5.04	4.24	3.97	3.60	3.39	3.13	2.91
200	5.05	4.27	4.00	3.64	3.42	3.16	2.95	5.17	4.38	4.10	3.73	3.51	3.23	3.02
210	5.19	4.41	4.14	3.77	3.55	3.28	3.06	5.30	4.52	4.23	3.86	3.63	3.35	3.13
220	5.32	4.55	4.27	3.90	3.68	3.40	3.18	5.44	4.64	4.36	3.98	3.76	3.47	3.24
230	5.45	4.68	4.41	4.03	3.80	3.52	3.29	5.56	4.78	4.49	4.11	3.88	3.59	3.36
240	5.58	4.80	4.52	4.15	3.91	3.63	3.40	5.70	4.91	4.63	4.23	4.00	3.70	3.47
250	5.71	4.94	4.66	4.27	4.04	3.74	3.51	5.81	5.03	4.74	4.35	4.12	3.81	3.58

**Notes:**

These tables are not applicable to slabs where the deck is supplied in single span lengths (use Multideck Design software to determine suitable bottom bar requirements)

# Multideck 50-V2 Features and Applications



Two Towers, Arnhem, Netherlands.  
Photo Courtesy of MSW (UK) Ltd.

## Multideck 50-V2

Multideck 50-V2 is a 'dovetail' profile deck with a depth of 50mm providing spans up to 4m unpropped.

- **Greater Design Efficiency**

The larger range of Multideck gauge thicknesses available allow much closer matching of design requirements and deck performance.

- **Quicker Installation**

No temporary supports required under most conditions. A wide range of accessories allows for easy installation of ceilings and services.

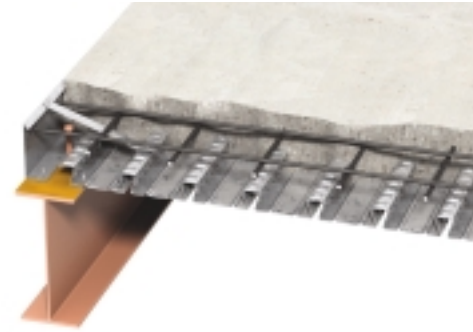
- **Value for Money**

Bulk steel buying by Kingspan ensures a quality product at the right price.

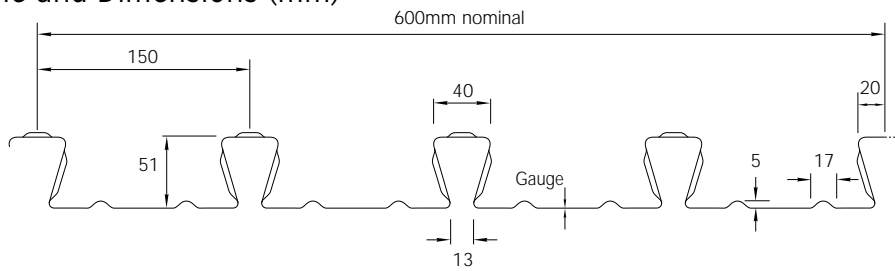
- **Technical Support**

The Multideck technical department provides a comprehensive design and advisory service to specifiers and end users. Further details are also available on the Kingspan Toolkit Software.

# Multideck 50-V2 Specification and Design



## Profile and Dimensions (mm)



Gauge = 0.8, 0.9, 1.0, 1.2mm

Maximum length: 12 metres

Note: For design information on 0.8mm profile contact Kingspan Technical Services on 01944 712000

## Section Properties per Metre Width

Section properties per metre width							
Normal Thickness (mm)	Self Weight		Height to Neutral Axis	Second Moment of Area (cm <sup>4</sup> /m)	Steel Area (mm <sup>2</sup> /m)	Ultimate Moment Capacity (kNm/m)	
	(kg/m <sup>2</sup> )	(kN/m <sup>2</sup> )	Sagging			Sagging	Hogging
0.90	12.89	0.126	16.7 mm	67.68	1605	6.50	6.30
1.00	14.36	0.141	17.0 mm	74.26	1792	7.50	7.40
1.20	17.29	0.170	17.4 mm	95.55	2165	9.10	8.90

## Material Specification - 350N/mm<sup>2</sup> Steel

Steel strip for Multideck 50-V2 complies with BS EN 10143 and BS EN 10147 with a guaranteed minimum yield strength of 350N/mm<sup>2</sup> and a minimum total coating mass (including both sides) of 275g/m<sup>2</sup>.

## Concrete Volumes & Specification

Load/span tables are based on Grade 30 concrete, having a design strength of 30N/mm<sup>2</sup>.

Density of normal weight concrete: 2400kg/m<sup>3</sup> at wet stage.

Density of lightweight concrete: 1900kg/m<sup>3</sup> at wet stage.

## Volume & Weight of Composite Slabs

Slab Depth (mm)	Concrete Volume (m <sup>3</sup> /m <sup>2</sup> )	Weight (kN/m <sup>2</sup> )			
		Normal weight Concrete		Lightweight Concrete	
		Wet	Dry	Wet	Dry
100	0.091	2.14	2.10	1.70	1.61
110	0.101	2.38	2.33	1.88	1.78
120	0.111	2.61	2.56	2.07	1.96
125	0.116	2.73	2.67	2.16	2.05
130	0.121	2.85	2.79	2.26	2.14
140	0.131	3.08	3.02	2.44	2.31
150	0.141	3.32	3.25	2.63	2.49
160	0.151	3.56	3.48	2.81	2.67
170	0.161	3.79	3.71	3.00	2.84
200	0.191	4.50	4.40	3.56	3.37
250	0.241	5.67	5.56	4.49	4.26

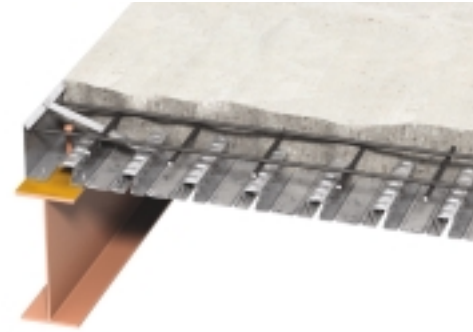
0 Notes:

- 1 Important - Concrete volumes do not take into account deflection.
- 2 Excludes weight of steel decking and relates only to weight of concrete.
- 3 Concrete volumes are based upon a calculated minimum value. (Nominal slab depth)  
Account should be taken of deck and supporting structure deflections.



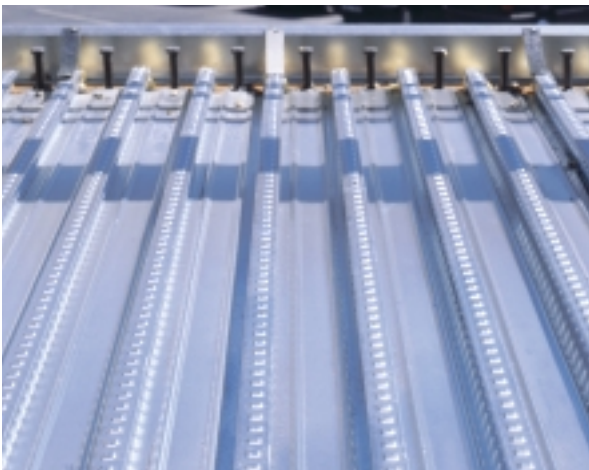



# Multideck 50-V2 Load Tables (Notes)



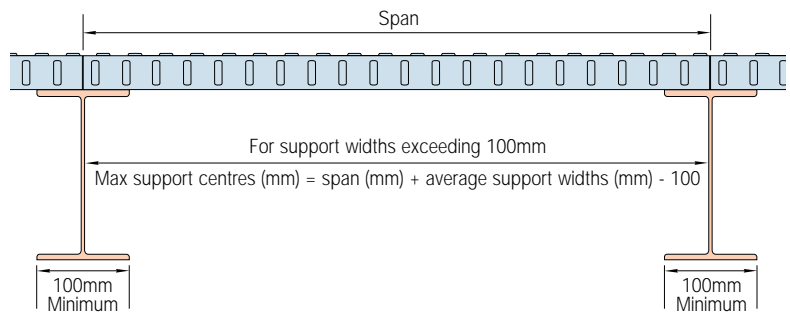
When using load tables for Multideck 50-V2 please take into consideration the following notes:

- 1 All tabulated figures include the self weight of the slab.
- 2 All tabulated figures include a construction allowance of 1.5kN/m<sup>2</sup> and for spans less than 3m construction allowance is 4.5/span.
- 3 The suggested maximum ratios of slab span to slab depth are 30 for LWC and 35 for NWC to control deflections. Deflection under construction loading (wet concrete etc.) has been limited to that stipulated in BS 5950: Part 4 1994.
- 4 Minimum reinforcement mesh sizes provide 0.1% of the gross cross-sectional area of the concrete at the support.
- 5 The composite slabs should meet the requirements of BS 5950: Part 4 1994 with regard to their composite behaviour under normal imposed loads.
- 6 Total applied load referred to in the load tables is a working load based on factored combinations of live loads, finishes, ceilings, services and partitions, divided by a load factor of 1.60 (excluding slab self weight).
- 7 Temporary supports should remain in place until the concrete has achieved its 75% of its 28 day cube strength often available after 7 days.
- 8 Where ★ appears the addition of props gives no further benefit in these cases.
- 9 Propped loads assume props are equally spaced.
- 10 Deck must lie flat on all support beams. Point only contact will affect design loading.
- 11 Where figures in **red** appear this shows the maximum permissible spans in situations where there is one stud per trough.
- 12 Span values are based on 100mm minimum support widths.
- 13 Construction stage spans are generally noted under the 4.0 kN/m<sup>2</sup> loads and shaded. For confirmation of maximum unpropped spans see page 65.



 **Tip: Use the Kingspan Toolkit CD with Word output to save time on your structural calculations.**

## Definition of Span (Construction Stage) When Using Kingspan Load Tables



### Support widths greater than 100mm?

The span capacities shown on the following pages can be increased by the difference between the actual support widths and 100mm.

### Example

Support widths 140mm and 200mm.

Span values can be increased by  $(140 + 200)/2 - 100 = 70$ mm.

MD50-V2 1.2mm double span deck (no props).

150mm thick slab- normal weight concrete.

Construction stage span from page 43,

4.0kN/m<sup>2</sup> load column = 3420mm.



with support widths of 140 and 200 the increased span capacity is  $3420 + 70 = 3490$ mm.

# Multideck 50-V2

## Normal Weight Concrete Load Tables



### Unpropped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 41)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 0.9mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0
	100	A98	3.00	3.00	3.00	3.00	3.00	3.00
	110	A98	2.91	2.91	2.91	2.91	2.91	2.91
	120	A142	2.82	2.82	2.82	2.82	2.82	2.82
	130	A142	2.75	2.75	2.75	2.75	2.75	2.75
	140	A142	2.69	2.69	2.69	2.69	2.69	2.69
	150	A142	2.63	2.63	2.63	2.63	2.63	2.63
	160	A193	2.57	2.57	2.57	2.57	2.57	2.57
	175	A193	2.49	2.49	2.49	2.49	2.49	2.49
	200	A193	2.36	2.36	2.36	2.36	2.36	2.36
	250	A252	2.16	2.16	2.16	2.16	2.16	2.16
	100	A98	3.29	3.29	3.29	3.29	3.29	3.19
	110	A98	3.20	3.20	3.20	3.20	3.20	3.20
	120	A142	3.12	3.12	3.12	3.12	3.12	3.12
	130	A142	3.04	3.04	3.04	3.04	3.04	3.04
	140	A142	2.96	2.96	2.96	2.96	2.96	2.96
	150	A142	2.88	2.88	2.88	2.88	2.88	2.88
	160	A193	2.81	2.81	2.81	2.81	2.81	2.81
	175	A193	2.71	2.71	2.71	2.71	2.71	2.71
	200	A193	2.57	2.57	2.57	2.57	2.57	2.57
	250	A252	2.34	2.34	2.34	2.34	2.34	2.34

### Propped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 41)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 0.9mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0
	100	A98	3.85	3.50	3.50	3.50	3.41	★
	110	A98	4.14	3.85	3.85	3.85	3.62	3.39
	120	A142	4.42	4.20	4.20	4.10	3.79	3.55
	130	A142	4.70	4.55	4.55	4.27	3.95	3.70
	140	A142	4.97	4.90	4.83	4.42	4.10	3.84
	150	A142	5.25	5.25	4.98	4.57	4.24	3.97
	160	A193	5.57	5.57	5.13	4.71	4.37	4.10
	175	A193	5.37	5.37	5.33	4.90	4.56	4.28
	200	A193	5.09	5.09	5.09	5.09	4.84	4.55
	250	A252	4.65	4.65	4.65	4.65	4.65	4.65
	160	A193	5.60	5.60	★	★	★	★
	175	A193	6.12	5.89	★	★	★	★
	200	A193	6.97	6.20	5.63	5.19	★	★
	250	A252	6.94	6.69	6.13	5.68	5.32	5.02

**Notes:**

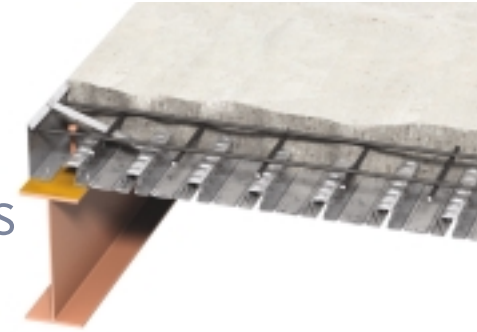
Total applied load referred to in the above table is a working load based on factored combinations of live loads, finishes, ceilings, services and partitions, divided by a load factor of 1.60 (excluding slab self weight).

Figures in red are maximum permissible spans in situations where there is one stud per trough.

Permanent Support ▲ Temporary Support ↑

# Multideck 50-V2

## Normal Weight Concrete Load Tables



### Unpropped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 41)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.0mm						Gauge = 1.2mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS						Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	100	A98	3.08	3.08	3.08	3.00	3.00	3.00	3.34	3.34	3.31	3.07	3.00	3.00
	110	A98	2.99	2.99	2.99	2.99	2.99	2.99	3.24	3.24	3.24	3.24	3.24	3.24
	120	A142	2.91	2.91	2.91	2.91	2.91	2.91	3.15	3.15	3.15	3.15	3.15	3.15
	130	A142	2.83	2.83	2.83	2.83	2.83	2.83	3.07	3.07	3.07	3.07	3.07	3.07
	140	A142	2.76	2.76	2.76	2.76	2.76	2.76	2.99	2.99	2.99	2.99	2.99	2.99
	150	A142	2.70	2.70	2.70	2.70	2.70	2.70	2.93	2.93	2.93	2.93	2.93	2.93
	160	A193	2.65	2.65	2.65	2.65	2.65	2.65	2.87	2.87	2.87	2.87	2.87	2.87
	175	A193	2.57	2.57	2.57	2.57	2.57	2.57	2.78	2.78	2.78	2.78	2.78	2.78
	200	A193	2.46	2.46	2.46	2.46	2.46	2.46	2.67	2.67	2.67	2.67	2.67	2.67
	250	A252	2.29	2.29	2.29	2.29	2.29	2.29	2.48	2.48	2.48	2.48	2.48	2.48
	100	A98	3.53	3.53	3.50	3.50	3.38	3.17	3.87	3.64	3.50	3.50	3.37	3.16
	110	A98	3.44	3.44	3.44	3.44	3.44	3.44	3.77	3.77	3.77	3.77	3.73	3.52
	120	A142	3.35	3.35	3.35	3.35	3.35	3.35	3.67	3.67	3.67	3.67	3.67	3.67
	130	A142	3.27	3.27	3.27	3.27	3.27	3.27	3.58	3.58	3.58	3.58	3.58	3.58
	140	A142	3.19	3.19	3.19	3.19	3.19	3.19	3.50	3.50	3.50	3.50	3.50	3.50
	150	A142	3.12	3.12	3.12	3.12	3.12	3.12	3.42	3.42	3.42	3.42	3.42	3.42
	160	A193	3.05	3.05	3.05	3.05	3.05	3.05	3.35	3.35	3.35	3.35	3.35	3.35
	175	A193	2.94	2.94	2.94	2.94	2.94	2.94	3.25	3.25	3.25	3.25	3.25	3.25
	200	A193	2.79	2.79	2.79	2.79	2.79	2.79	3.10	3.10	3.10	3.10	3.10	3.10
	250	A252	2.54	2.54	2.54	2.54	2.54	2.54	2.83	2.83	2.83	2.83	2.83	2.83

### Propped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 41)



Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.0mm						Gauge = 1.2mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS						Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	100	A98	3.90	3.55	★	★	★	★	4.00	★	★	★	★	★
	110	A98	4.19	3.85	3.85	3.85	3.78	3.54	4.30	3.93	3.85	3.85	3.76	★
	120	A142	4.48	4.20	4.20	4.20	3.99	3.73	4.59	4.21	4.20	4.20	4.13	3.87
	130	A142	4.76	4.55	4.55	4.49	4.16	3.89	4.88	4.55	4.55	4.55	4.51	4.23
	140	A142	5.04	4.90	4.90	4.65	4.31	4.04	5.16	4.90	4.90	4.90	4.71	4.42
	150	A142	5.31	5.25	5.24	4.81	4.46	4.18	5.43	5.25	5.25	5.25	4.88	4.57
	160	A193	5.60	5.60	5.39	4.95	4.60	4.32	5.70	5.60	5.60	5.41	5.03	4.72
	175	A193	5.84	5.84	5.61	5.16	4.80	4.50	6.12	6.12	6.12	5.63	5.24	4.92
	200	A193	5.53	5.53	5.53	5.46	5.09	4.79	6.15	6.15	6.15	5.97	5.57	5.24
	250	A252	5.04	5.04	5.04	5.04	5.04	5.04	5.61	5.61	5.61	5.61	5.61	5.61
	160	A193	★	★	★	★	★	★	★	★	★	★	★	★
	175	A193	6.12	6.12	★	★	★	★	★	★	★	★	★	★
	200	A193	7.00	6.52	5.92	★	★	★	7.00	7.00	6.46	★	★	★
	250	A252	7.54	7.04	6.45	5.98	5.60	5.28	8.39	7.68	7.04	6.53	6.12	5.78

Multideck 50-V2

# Multideck 50-V2 Lightweight Concrete Load Tables



## Unpropped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 41)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 0.9mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0
	100 LWC	A98	3.22	3.22	2.99	2.77	2.61	2.50
	110 LWC	A98	3.12	3.12	3.12	3.01	2.84	2.75
	120 LWC	A142	3.03	3.03	3.03	3.03	3.03	3.00
	130 LWC	A142	2.95	2.95	2.95	2.95	2.95	2.95
	140 LWC	A142	2.88	2.88	2.88	2.88	2.88	2.88
	150 LWC	A142	2.82	2.82	2.82	2.82	2.82	2.82
	160 LWC	A193	2.76	2.76	2.76	2.76	2.76	2.76
	175 LWC	A193	2.68	2.68	2.68	2.68	2.68	2.68
	200 LWC	A193	2.57	2.57	2.57	2.57	2.57	2.57
	250 LWC	A252	2.36	2.36	2.36	2.36	2.36	2.36
	100 LWC	A98	3.49	3.29	3.00	3.00	3.00	3.00
	110 LWC	A98	3.41	3.41	3.30	3.30	3.30	3.30
	120 LWC	A142	3.33	3.33	3.33	3.33	3.33	3.33
	130 LWC	A142	3.25	3.25	3.25	3.25	3.25	3.25
	140 LWC	A142	3.18	3.18	3.18	3.18	3.18	3.18
	150 LWC	A142	3.12	3.12	3.12	3.12	3.12	3.12
	160 LWC	A193	3.06	3.06	3.06	3.06	3.06	3.06
	175 LWC	A193	2.96	2.96	2.96	2.96	2.96	2.96
	200 LWC	A193	2.81	2.81	2.81	2.81	2.81	2.81
	250 LWC	A252	2.57	2.57	2.57	2.57	2.57	2.57

## Propped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 41)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 0.9mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0
	100 LWC	A98	3.72	★	★	★	★	★
	110 LWC	A98	4.00	3.57	★	★	★	★
	120 LWC	A142	4.28	3.86	3.60	3.60	3.60	3.60
	130 LWC	A142	4.56	4.15	3.90	3.90	3.90	3.76 3.90
	140 LWC	A142	4.82	4.41	4.20	4.20	4.19	3.91 4.09
	150 LWC	A142	5.09	4.66	4.50	4.50	4.34 4.50	4.06 4.26
	160 LWC	A193	5.35	4.91	4.80	4.80	4.48 4.72	4.19 4.42
	175 LWC	A193	5.73	5.27	5.25	5.06 5.25	4.68 4.96	4.38 4.65
	200 LWC	A193	5.57	5.57	5.57	5.38 5.57	4.99 5.32	4.68 4.99
	250 LWC	A252	5.10	5.10	5.10	5.10	5.10	5.10
	160 LWC	A193	★	★	★	★	★	★
	175 LWC	A193	★	★	★	★	★	★
	200 LWC	A193	6.33	6.00	5.87 6.00	★ 5.71	★	★
	250 LWC	A252	7.50	7.10 7.50	6.43 6.85	5.92 6.34	5.52 5.92	5.19 5.58

### Notes:

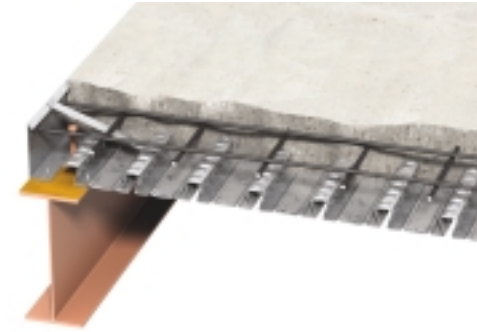
Total applied load referred to in the above table is a working load based on factored combinations of live loads, finishes, ceilings, services and partitions, divided by a load factor of 1.60 (excluding slab self weight).

Figures in red are maximum permissible spans in situations where there is one stud per trough.

Permanent Support ▲ Temporary Support ↑

# Multideck 50-V2

## Lightweight Concrete Load Tables



### Unpropped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 41)

Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.0mm						Gauge = 1.2mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS						Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	100 LWC A98	A98	3.31	3.31	3.03	2.81	2.64	2.51	3.57	3.44	3.12	2.90	2.73	2.59
	110 LWC A98	A98	3.21	3.21	3.21	3.05	2.87	2.75	3.47	3.47	3.38	3.14	2.95	2.80
	120 LWC A142	A142	3.12	3.12	3.12	3.12	3.10	3.00	3.37	3.37	3.37	3.37	3.19	3.03
	130 LWC A142	A142	3.04	3.04	3.04	3.04	3.04	3.04	3.29	3.29	3.29	3.29	3.29	3.25
	140 LWC A142	A142	2.97	2.97	2.97	2.97	2.97	2.97	3.21	3.21	3.21	3.21	3.21	3.21
	150 LWC A142	A142	2.90	2.90	2.90	2.90	2.90	2.90	3.14	3.14	3.14	3.14	3.14	3.14
	160 LWC A193	A193	2.84	2.84	2.84	2.84	2.84	2.84	3.08	3.08	3.08	3.08	3.08	3.08
	175 LWC A193	A193	2.76	2.76	2.76	2.76	2.76	2.76	2.99	2.99	2.99	2.99	2.99	2.99
	200 LWC A193	A193	2.65	2.65	2.65	2.65	2.65	2.65	2.87	2.87	2.87	2.87	2.87	2.87
250 LWC A252	A252	2.46	2.46	2.46	2.46	2.46	2.46	2.67	2.67	2.67	2.67	2.67	2.67	
	100 LWC A98	A98	3.74	3.33	3.03	3.00	3.00	3.00	3.93	3.44	3.12	3.00	3.00	3.00
	110 LWC A98	A98	3.65	3.62	3.30	3.30	3.30	3.30	4.00	3.72	3.38	3.30	3.30	3.30
	120 LWC A142	A142	3.57	3.57	3.57	3.57	3.57	3.57	3.91	3.91	3.65	3.60	3.60	3.60
	130 LWC A142	A142	3.49	3.49	3.49	3.49	3.49	3.49	3.82	3.82	3.82	3.82	3.82	3.82
	140 LWC A142	A142	3.41	3.41	3.41	3.41	3.41	3.41	3.74	3.74	3.74	3.74	3.74	3.74
	150 LWC A142	A142	3.35	3.35	3.35	3.35	3.35	3.35	3.67	3.67	3.67	3.67	3.67	3.67
	160 LWC A193	A193	3.28	3.28	3.28	3.28	3.28	3.28	3.59	3.59	3.59	3.59	3.59	3.59
	175 LWC A193	A193	3.19	3.19	3.19	3.19	3.19	3.19	3.49	3.49	3.49	3.49	3.49	3.49
	200 LWC A193	A193	3.05	3.05	3.05	3.05	3.05	3.05	3.35	3.35	3.35	3.35	3.35	3.35
250 LWC A252	A252	2.79	2.79	2.79	2.79	2.79	2.79	3.10	3.10	3.10	3.10	3.10	3.10	

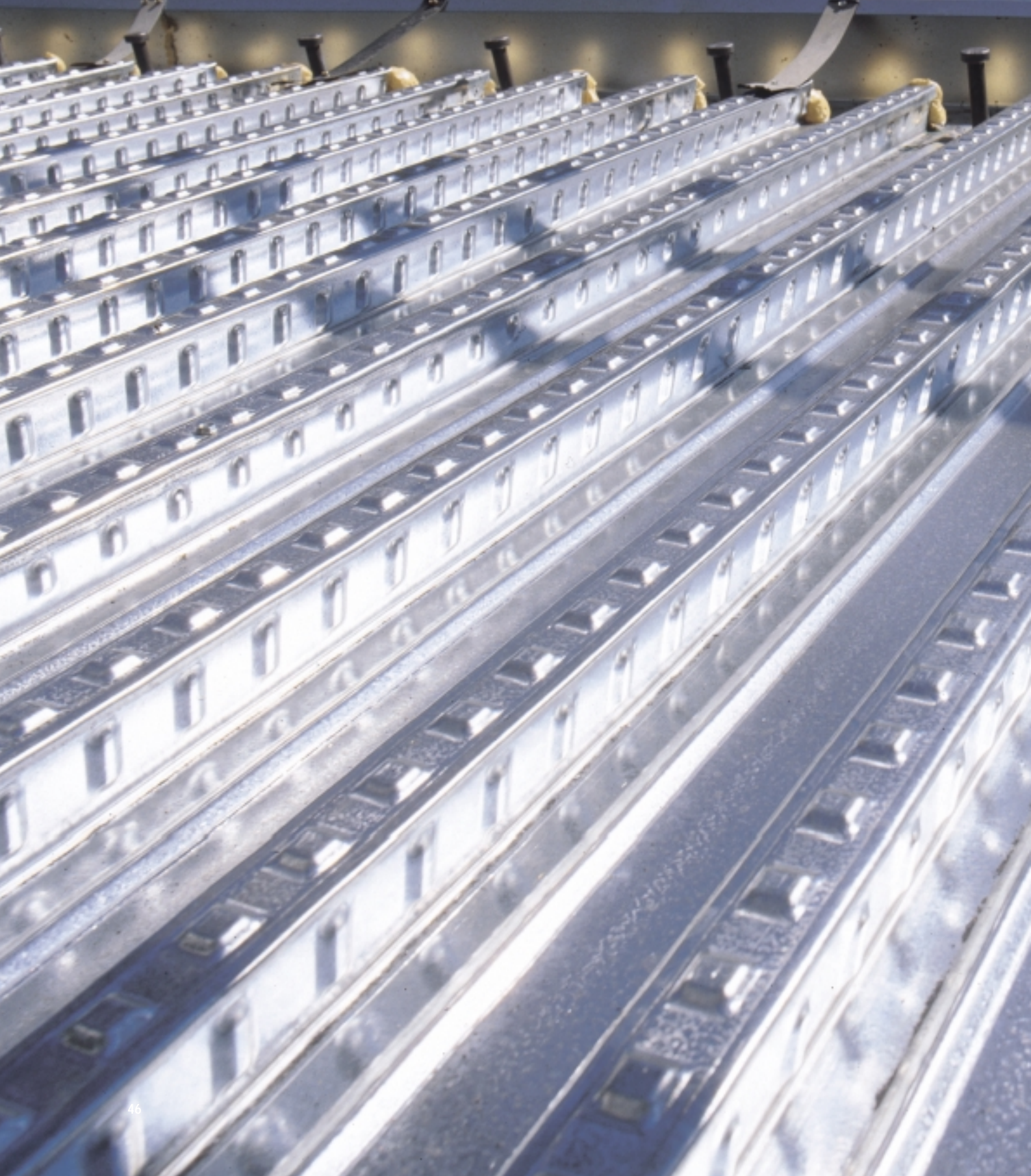
### Propped - Load/Span Table (Steel - 350N/mm<sup>2</sup>)

Span (m) (see diagram page 41)

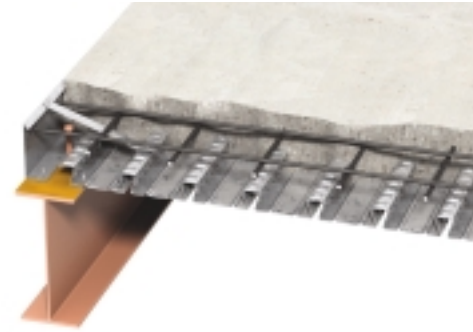
Span Type (Support Condition)	Slab Depth (mm)	Min Mesh Size	Gauge = 1.0mm						Gauge = 1.2mm					
			Total Applied Load (kN/m <sup>2</sup> ) SLS						Total Applied Load (kN/m <sup>2</sup> ) SLS					
			4.0	6.0	8.0	10.0	12.0	14.0	4.0	6.0	8.0	10.0	12.0	14.0
	100 LWC A98	A98	3.76	★	★	★	★	★	★	★	★	★	★	★
	110 LWC A98	A98	4.05	★	★	★	★	★	4.15	★	★	★	★	★
	120 LWC A142	A142	4.33	3.91	3.60	3.60	3.60	3.60	4.44	4.02	★	★	★	★
	130 LWC A142	A142	4.61	4.20	3.90	3.90	3.90	3.90	4.73	4.31	3.92	3.90	3.90	3.90
	140 LWC A142	A142	4.89	4.47	4.20	4.20	4.20	4.12	5.00	4.58	4.20	4.20	4.20	4.20
	150 LWC A142	A142	5.15	4.72	4.50	4.50	4.50	4.27	5.28	4.84	4.50	4.50	4.50	4.50
	160 LWC A193	A193	5.42	4.97	4.80	4.80	4.72	4.41	5.55	5.10	4.80	4.80	4.80	4.80
	175 LWC A193	A193	5.80	5.34	5.25	5.25	4.93	4.61	5.94	5.47	5.25	5.25	5.25	5.04
	200 LWC A193	A193	6.06	6.00	6.00	5.66	5.25	4.92	6.57	6.80	6.00	6.00	5.74	5.38
250 LWC A252	A252	5.54	5.54	5.54	5.54	5.54	5.46	6.15	6.15	6.15	6.15	6.15	5.96	
	160 LWC A193	A193	★	★	★	★	★	★	★	★	★	★	★	★
	175 LWC A193	A193	★	★	★	★	★	★	★	★	★	★	★	★
	200 LWC A193	A193	6.41	★	★	★	★	★	★	★	★	★	★	★
	250 LWC A252	A252	7.56	7.46	6.77	6.23	5.81	★	7.74	7.50	7.38	6.81	6.34	★
			7.50	7.19	6.65	6.22	5.86			7.50	7.22	6.75	6.36	

Multideck 50-V2

Kingspan Multideck was used in the construction of the Meadowhall Extension.  
Photo Courtesy of MSW (UK) Ltd.



# Multideck 50-V2 Fire Performance



## Fire Performance

- 1 The fire resistance tables for Multideck 50-V2 on pages following are based upon fire test data from full scale tests performed at the Warrington Fire Research Centre, May 1998.
- 2 All stated slab depths comply with the minimum fire insulation criteria of BS 476: Part 20 1987.
- 3 The composite slab is assumed to be continuous over one or more intermediate supports. i.e. minimum double span.
- 4 The fire resistance load tables are for continuous spans only with no propping. For propped and single span conditions use the Kingspan Toolkit Software or contact Kingspan Technical Services.

- 5 Minimum laps should be 300mm for A142 mesh and 400mm for A193 and A252 mesh.
- 6 The mesh should be placed between 20 & 40mm from the upper surface of the slab. (This range caters for lap areas.)
- 7 The tables are based upon Grade 30 concrete, reinforcement having a yield strength of 460N/mm<sup>2</sup>.
- 8 The tables must be read in conjunction with load/span tables for Multideck 50-V2 to verify the structural integrity of the composite slab.
- 9 The values in all the tables are relevant to unpropped construction.
- 10 The tables take into account the reduced partial factor of 0.8 as permitted in BS 5950: Part 8 for non-permanent imposed loads. The tables are presented in terms of total specified imposed load (non-permanent and permanent). It is assumed that the permanent imposed loads for partitions, finishes, ceilings and services are equivalent to 1.7kN/m<sup>2</sup> in all cases. The tables are therefore appropriate for office type applications.

For other applications where the imposed loads are almost entirely permanent the total load should be adjusted accordingly before reading from the tables,

eg:

150mm normal weight concrete plantroom slab and A142 mesh  
7.5kN/m<sup>2</sup> live load

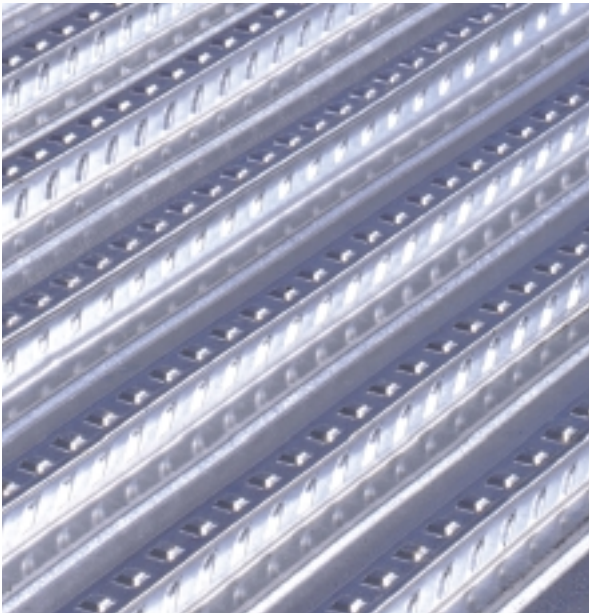
1.2kN/m<sup>2</sup> 50mm screed finish 0.5kn/m<sup>2</sup> ceilings and services  
1 hour fire rating

Multideck 50-V2 profile

Total applied load = 1.2 + 0.5 + 7.5/0.8 = 11.075kN/m<sup>2</sup>

From table overleaf maximum span = 3.60m.

- 11 The \* denotes that the mesh provided, although satisfying the fire resistance requirement, does not comply with the minimum anti-crack reinforcement requirement of BS 5950: Part 4. Refer to standard load/span tables for minimum mesh requirements.
- 12 For loan/span conditions beyond the scope of these tables the Fire Engineering Method as detailed in the SCI Publication 056 should be adopted or use Kingspan Toolkit Software. Please contact our Technical Services Department for advice. See following pages for Multideck 50-V2 Fire Resistance Tables.
- 13 These tables apply to all gauges 0.9mm and above.



# Multideck 50-V2

## Fire Resistance Load Tables

### Unpropped - Normal Weight Concrete

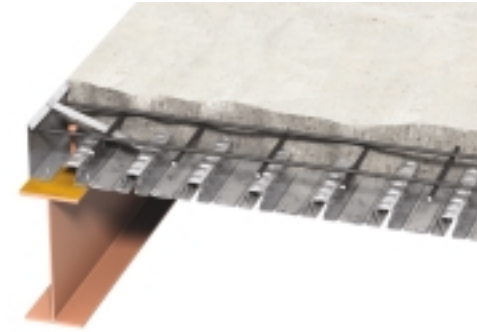
Slab Depth (mm)	Min Mesh Size	Span (m)																	
		Fire rating: 1.0 hour									Fire rating: 1.5 hours								
		Total Applied Load (kN/m <sup>2</sup> )									Total Applied Load (kN/m <sup>2</sup> )								
4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00		
100	A142	3.50	3.50	3.50	3.50	3.43	3.30	3.17	3.07	2.96	-	-	-	-	-	-	-	-	
100	A193	3.50	3.50	3.50	3.50	3.50	3.43	3.36	3.25	3.14	-	-	-	-	-	-	-	-	
100	A252	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.42	3.33	-	-	-	-	-	-	-	-	
110	A142	3.85	3.85	3.85	3.75	3.57	3.44	3.31	3.21	3.10	3.80	3.58	3.40	3.24	3.10	2.99	2.88	2.79	2.69
110	A193	3.85	3.85	3.85	3.85	3.79	3.65	3.51	3.40	3.29	3.85	3.85	3.65	3.49	3.34	3.22	3.09	2.99	2.89
110	A252	3.85	3.85	3.85	3.85	3.85	3.79	3.73	3.61	3.49	3.85	3.85	3.85	3.73	3.57	3.44	3.31	3.21	3.10
125	A142	4.38	4.33	4.11	3.93	3.77	3.64	3.50	3.39	3.28	3.98	3.76	3.58	3.42	3.28	3.17	3.05	2.96	2.86
125	A193	4.38	4.38	4.37	4.18	4.01	3.87	3.72	3.61	3.49	4.29	4.05	3.85	3.68	3.53	3.41	3.28	3.18	3.08
125	A252	4.38	4.38	4.38	4.37	4.26	4.11	3.95	3.83	3.70	4.38	4.35	4.13	3.95	3.78	3.65	3.51	3.40	3.29
130	A142	4.55	4.39	4.18	3.99	3.83	3.70	3.56	3.45	3.34	4.04	3.82	3.63	3.48	3.33	3.22	3.10	3.01	2.91
130	A193	4.55	4.55	4.44	4.25	4.07	3.93	3.78	3.67	3.55	4.35	4.12	3.91	3.74	3.59	3.47	3.34	3.24	3.13
130	A252	4.55	4.55	4.55	4.50	4.32	4.17	4.02	3.90	3.77	4.55	4.42	4.20	4.02	3.85	3.72	3.58	3.47	3.36
140	A142	4.73	4.48	4.27	4.08	3.92	3.79	3.65	3.54	3.43	4.14	3.92	3.73	3.58	3.43	3.32	3.20	3.10	3.00
140	A193	4.90	4.77	4.54	4.34	4.17	4.03	3.88	3.76	3.64	4.46	4.22	4.02	3.85	3.70	3.57	3.44	3.34	3.23
140	A252	4.90	4.90	4.82	4.61	4.43	4.28	4.12	4.00	3.87	4.79	4.53	4.32	4.13	3.97	3.83	3.69	3.58	3.47
150	A142	4.80	4.55	4.34	4.16	4.00	3.86	3.72	3.61	3.50	4.22	4.00	3.82	3.66	3.52	3.40	3.28	3.19	3.09
150	A193	5.10	4.84	4.62	4.42	4.25	4.11	3.96	3.84	3.72	4.55	4.32	4.12	3.95	3.79	3.67	3.54	3.44	3.33
150	A252	5.25	5.14	4.90	4.69	4.51	4.36	4.20	4.08	3.95	4.89	4.65	4.42	4.24	4.07	3.94	3.80	3.69	3.57
160	A142	4.86	4.62	4.41	4.23	4.07	3.94	3.80	3.69	3.58	4.27	4.06	3.88	3.72	3.58	3.46	3.34	3.25	3.15
160	A193	5.17	4.91	4.69	4.50	4.32	4.18	4.03	3.92	3.80	4.61	4.38	4.18	4.01	3.86	3.73	3.60	3.50	3.39
160	A252	5.49	5.21	4.98	4.77	4.59	4.44	4.28	4.15	4.03	4.95	4.71	4.49	4.31	4.14	4.01	3.87	3.76	3.64
200	A142	5.07	4.85	4.65	4.47	4.32	4.19	4.05	3.94	3.83	4.44	4.24	4.07	3.92	3.78	3.67	3.55	3.46	3.36
200	A193	5.38	5.14	4.93	4.75	4.58	4.44	4.30	4.18	4.06	4.78	4.57	4.39	4.23	4.07	3.95	3.82	3.72	3.61
200	A252	5.71	5.45	5.23	5.03	4.86	4.71	4.56	4.44	4.31	5.14	4.91	4.71	4.53	4.37	4.24	4.10	3.99	3.88
250	A142	5.27	5.06	4.88	4.72	4.56	4.43	4.30	4.20	4.09	4.60	4.42	4.26	4.12	3.98	3.87	3.76	3.67	3.57
250	A193	5.58	5.36	5.17	4.99	4.83	4.70	4.56	4.45	4.33	4.95	4.75	4.58	4.43	4.28	4.16	4.04	3.94	3.84
250	A252	5.92	5.68	5.47	5.29	5.12	4.98	4.83	4.71	4.58	5.30	5.10	4.91	4.75	4.59	4.46	4.33	4.22	4.11

### Unpropped - Normal Weight Concrete

Slab Depth (mm)	Min Mesh Size	Span (m)									
		Fire rating: 2.0 hours									
		Total Applied Load (kN/m <sup>2</sup> )									
4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00			
100	A142	-	-	-	-	-	-	-	-	-	
100	A193	-	-	-	-	-	-	-	-	-	
100	A252	-	-	-	-	-	-	-	-	-	
110	A142	-	-	-	-	-	-	-	-	-	
110	A193	-	-	-	-	-	-	-	-	-	
110	A252	-	-	-	-	-	-	-	-	-	
125	A142	3.34	3.15	3.00	2.87	2.75	2.66	2.56	2.48	2.40	
125	A193	3.67	3.47	3.30	3.16	3.03	2.92	2.81	2.73	2.64	
125	A252	4.01	3.79	3.60	3.45	3.30	3.18	3.06	2.97	2.88	
130	A142	3.39	3.21	3.05	2.92	2.80	2.70	2.60	2.53	2.45	
130	A193	3.73	3.53	3.36	3.21	3.08	2.97	2.86	2.78	2.69	
130	A252	4.08	3.86	3.67	3.51	3.36	3.25	3.13	3.04	2.94	
140	A142	3.47	3.29	3.14	3.00	2.88	2.79	2.69	2.61	2.53	
140	A193	3.82	3.62	3.45	3.31	3.17	3.07	2.96	2.87	2.78	
140	A252	4.18	3.96	3.77	3.62	3.47	3.35	3.23	3.13	3.03	
150	A142	3.55	3.37	3.21	3.08	2.96	2.86	2.76	2.68	2.60	
150	A193	3.92	3.72	3.55	3.40	3.27	3.16	3.05	2.96	2.87	
150	A252	4.28	4.06	3.87	3.71	3.57	3.45	3.32	3.23	3.13	
160	A142	3.61	3.44	3.28	3.15	3.03	2.93	2.83	2.75	2.67	
160	A193	3.99	3.79	3.62	3.47	3.34	3.23	3.12	3.03	2.94	
160	A252	4.36	4.14	3.96	3.80	3.65	3.53	3.41	3.31	3.21	
200	A142	3.74	3.58	3.43	3.31	3.19	3.10	3.00	2.92	2.84	
200	A193	4.13	3.95	3.79	3.65	3.52	3.41	3.30	3.21	3.12	
200	A252	4.52	4.32	4.14	3.99	3.85	3.73	3.61	3.51	3.41	
250	A142	3.86	3.71	3.57	3.46	3.34	3.25	3.16	3.08	3.00	
250	A193	4.25	4.08	3.93	3.80	3.68	3.58	3.47	3.39	3.30	
250	A252	4.65	4.46	4.30	4.16	4.03	3.92	3.80	3.71	3.61	



# Multideck 50-V2 Fire Resistance Load Tables



## Unpropped - Lightweight Concrete

Span (m)

Slab Depth (mm)	Min Mesh Size	Fire rating: 1.0 hour										Fire rating: 1.5 hours									
		Total Applied Load (kN/m <sup>2</sup> )										Total Applied Load (kN/m <sup>2</sup> )									
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00		
100 LWC A142		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	-	-	-	-	-	-	-	-	-		
100 LWC A193		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	-	-	-	-	-	-	-	-	-		
100 LWC A252		3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	-	-	-	-	-	-	-	-	-		
105 LWC A142		3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.13	3.11	3.15	3.15	3.15	3.15	3.15	2.92	2.83	2.73			
105 LWC A193		3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.05	2.94			
105 LWC A252		3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15			
115 LWC A142		3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.35	3.25	3.45	3.45	3.45	3.42	3.31	3.19	3.06	2.86			
115 LWC A193		3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.38	3.30	3.19	3.08		
115 LWC A252		3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.39	3.32		
130 LWC A142		3.90	3.90	3.90	3.90	3.90	3.79	3.67	3.55	3.43	3.90	3.90	3.84	3.66	3.50	3.37	3.24	3.14	3.03		
130 LWC A193		3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.78	3.65	3.90	3.90	3.90	3.89	3.78	3.64	3.50	3.39	3.27		
130 LWC A252		3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.89	3.90	3.90	3.90	3.90	3.84	3.77	3.65	3.53			
140 LWC A142		4.20	4.20	4.20	4.18	4.06	3.91	3.76	3.64	3.52	4.20	4.15	3.94	3.76	3.60	3.47	3.33	3.23	3.12		
140 LWC A193		4.20	4.20	4.20	4.20	4.20	4.10	4.00	3.87	3.74	4.20	4.20	4.20	4.06	3.89	3.75	3.60	3.49	3.37		
140 LWC A252		4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.09	3.98	4.20	4.20	4.20	4.20	4.19	4.04	3.88	3.76	3.63		
150 LWC A142		4.50	4.50	4.50	4.32	4.14	3.99	3.84	3.72	3.60	4.47	4.22	4.01	3.83	3.67	3.54	3.40	3.30	3.19		
150 LWC A193		4.50	4.50	4.50	4.50	4.41	4.25	4.09	3.96	3.83	4.50	4.50	4.34	4.14	3.96	3.82	3.68	3.57	3.45		
150 LWC A252		4.50	4.50	4.50	4.50	4.50	4.43	4.35	4.21	4.07	4.50	4.50	4.50	4.45	4.27	4.12	3.96	3.84	3.71		
160 LWC A142		4.80	4.80	4.61	4.41	4.23	4.08	3.92	3.80	3.68	4.54	4.29	4.07	3.89	3.73	3.60	3.47	3.36	3.25		
160 LWC A193		4.80	4.80	4.80	4.69	4.49	4.33	4.17	4.04	3.91	4.80	4.63	4.40	4.21	4.03	3.89	3.75	3.64	3.52		
160 LWC A252		4.80	4.80	4.80	4.80	4.78	4.61	4.43	4.30	4.16	4.80	4.80	4.74	4.53	4.34	4.19	4.03	3.91	3.78		
200 LWC A142		5.40	5.13	4.89	4.69	4.51	4.36	4.21	4.09	3.96	4.74	4.51	4.30	4.12	3.97	3.84	3.70	3.60	3.49		
200 LWC A193		5.73	5.45	5.20	4.98	4.79	4.63	4.47	4.34	4.21	5.12	4.86	4.64	4.45	4.28	4.14	3.99	3.88	3.76		
200 LWC A252		6.00	5.78	5.52	5.29	5.08	4.91	4.74	4.60	4.46	5.51	5.23	4.99	4.78	4.60	4.45	4.29	4.17	4.04		
250 LWC A142		5.65	5.39	5.17	4.97	4.80	4.65	4.50	4.38	4.25	4.94	4.72	4.52	4.36	4.20	4.07	3.94	3.83	3.72		
250 LWC A193		5.99	5.72	5.48	5.27	5.09	4.93	4.77	4.64	4.51	5.32	5.08	4.87	4.69	4.52	4.38	4.24	4.13	4.01		
250 LWC A252		6.35	6.06	5.81	5.59	5.39	5.22	5.05	4.91	4.77	5.72	5.46	5.23	5.04	4.86	4.71	4.56	4.43	4.30		

## Unpropped - Lightweight Concrete

Span (m)

Slab Depth (mm)	Min Mesh Size	Fire rating: 2.0 hours																	
		Total Applied Load (kN/m <sup>2</sup> )																	
		4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00									
100 LWC A142		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100 LWC A193		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100 LWC A252		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105 LWC A142		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105 LWC A193		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105 LWC A252		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
115 LWC A142		3.45	3.29	3.11	2.96	2.83	2.72	2.61	2.53	2.44									
115 LWC A193		3.45	3.45	3.44	3.28	3.13	3.01	2.89	2.80	2.70									
115 LWC A252		3.45	3.45	3.45	3.45	3.42	3.29	3.16	3.06	2.95									
130 LWC A142		3.68	3.46	3.28	3.13	2.99	2.88	2.77	2.68	2.59									
130 LWC A193		3.90	3.84	3.64	3.47	3.31	3.19	3.07	2.97	2.87									
130 LWC A252		3.90	3.90	3.90	3.80	3.63	3.50	3.36	3.26	3.15									
140 LWC A142		3.79	3.57	3.39	3.23	3.09	2.98	2.87	2.78	2.69									
140 LWC A193		4.20	3.95	3.75	3.58	3.42	3.30	3.17	3.07	2.97									
140 LWC A252		4.20	4.20	4.12	3.93	3.76	3.62	3.48	3.37	3.26									
150 LWC A142		3.86	3.64	3.46	3.30	3.16	3.05	2.94	2.85	2.75									
150 LWC A193		4.27	4.03	3.83	3.66	3.50	3.38	3.25	3.15	3.05									
150 LWC A252		4.50	4.43	4.21	4.02	3.85	3.71	3.57	3.46	3.34									
160 LWC A142		3.90	3.68	3.50	3.35	3.21	3.10	2.99	2.90	2.80									
160 LWC A193		4.32	4.08	3.88	3.71	3.56	3.43	3.30	3.20	3.10									
160 LWC A252		4.74	4.48	4.26	4.07	3.90	3.77	3.63	3.52	3.40									
200 LWC A142		4.04	3.84	3.67	3.52	3.38	3.27	3.16	3.07	2.98									
200 LWC A193		4.47	4.25	4.06	3.89	3.74	3.62	3.49	3.39	3.29									
200 LWC A252		4.91	4.66	4.45	4.27	4.10	3.97	3.83	3.72	3.61									
250 LWC A142		4.18	3.99	3.83	3.69	3.56	3.45	3.34	3.25	3.16									
250 LWC A193		4.62	4.41	4.23	4.08	3.93	3.81	3.68	3.58	3.48									
250 LWC A252		5.06	4.83	4.64	4.46	4.30	4.17	4.04	3.93	3.81									

Multideck 50-V2

# Multideck 50-V2

## Fire Resistance Load Tables

### Dramix® Reinforced Concrete (20kg/m<sup>3</sup> RC-80/60-BN)

#### 1 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 0.9mm							Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
100	5.01	4.16	3.88	3.52	3.30	3.02	2.82	5.22	4.34	4.05	3.66	3.44	3.16	2.94
110	5.17	4.34	4.05	3.67	3.45	3.17	2.95	5.37	4.50	4.20	3.81	3.58	3.29	3.07
120	5.35	4.52	4.23	3.84	3.62	3.34	3.11	5.54	4.68	4.38	3.98	3.74	3.45	3.22
130	5.53	4.70	4.41	4.02	3.78	3.49	3.26	5.72	4.86	4.55	4.16	3.91	3.61	3.38
140	5.70	4.87	4.58	4.18	3.94	3.64	3.41	5.88	5.03	4.73	4.32	4.07	3.76	3.52
150	5.85	5.03	4.73	4.34	4.09	3.79	3.55	6.03	5.20	4.88	4.48	4.23	3.91	3.66
160	6.02	5.20	4.91	4.50	4.25	3.95	3.70	6.19	5.35	5.05	4.63	4.38	4.05	3.80
170	6.16	5.35	5.05	4.65	4.40	4.08	3.83	6.34	5.52	5.20	4.79	4.53	4.20	3.95
180	6.31	5.51	5.21	4.80	4.55	4.23	3.97	6.50	5.68	5.37	4.95	4.69	4.35	4.09
190	6.44	5.65	5.34	4.94	4.68	4.35	4.09	6.62	5.80	5.50	5.08	4.81	4.48	4.20
200	6.58	5.79	5.49	5.08	4.82	4.49	4.22	6.75	5.95	5.64	5.21	4.95	4.61	4.34

#### 1.5 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 0.9mm							Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
110	3.64	3.06	2.86	2.60	2.45	2.25	2.10	3.74	3.14	2.94	2.67	2.51	2.31	2.16
120	3.82	3.23	3.02	2.76	2.59	2.39	2.23	3.91	3.31	3.10	2.83	2.66	2.45	2.30
130	3.98	3.40	3.19	2.91	2.74	2.53	2.37	4.09	3.48	3.27	2.98	2.81	2.60	2.43
140	4.16	3.56	3.35	3.06	2.89	2.68	2.51	4.24	3.63	3.41	3.13	2.95	2.73	2.55
150	4.31	3.71	3.50	3.20	3.03	2.80	2.63	4.38	3.78	3.55	3.26	3.08	2.85	2.67
160	4.45	3.85	3.63	3.34	3.16	2.93	2.74	4.56	3.95	3.73	3.42	3.23	3.00	2.81
170	4.63	4.02	3.80	3.50	3.31	3.08	2.88	4.71	4.10	3.88	3.56	3.38	3.13	2.95
180	4.77	4.16	3.95	3.63	3.45	3.20	3.01	4.86	4.24	4.02	3.70	3.51	3.27	3.06
190	4.89	4.29	4.06	3.76	3.56	3.32	3.12	4.99	4.38	4.16	3.84	3.64	3.39	3.19
200	5.02	4.43	4.20	3.88	3.69	3.44	3.23	5.13	4.52	4.30	3.98	3.77	3.52	3.31

#### 2.0 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 0.9mm							Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
125	3.58	3.04	2.85	2.60	2.45	2.27	2.12	3.66	3.10	2.91	2.66	2.50	2.31	2.16
130	3.65	3.11	2.92	2.66	2.52	2.32	2.17	3.73	3.19	2.99	2.73	2.57	2.38	2.23
140	3.84	3.29	3.09	2.83	2.67	2.48	2.31	3.91	3.36	3.16	2.89	2.73	2.52	2.36
150	3.99	3.44	3.24	2.97	2.80	2.60	2.44	4.07	3.51	3.30	3.03	2.87	2.66	2.48
160	4.15	3.59	3.39	3.12	2.95	2.73	2.56	4.23	3.67	3.46	3.18	3.01	2.79	2.62
170	4.30	3.74	3.54	3.26	3.09	2.87	2.69	4.37	3.80	3.59	3.30	3.13	2.91	2.73
180	4.46	3.90	3.69	3.40	3.23	3.00	2.82	4.52	3.95	3.74	3.45	3.27	3.04	2.86
190	4.60	4.04	3.83	3.54	3.36	3.13	2.94	4.66	4.09	3.88	3.59	3.40	3.16	2.98
200	4.73	4.16	3.95	3.66	3.48	3.24	3.05	4.80	4.24	4.02	3.73	3.54	3.30	3.10

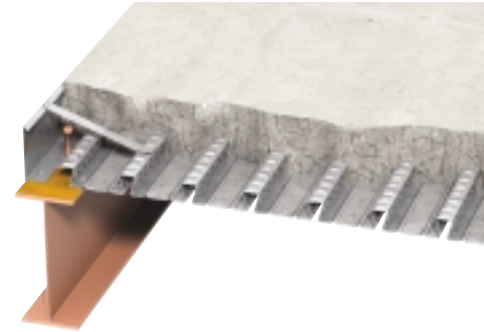
#### Notes:

These tables are not applicable to slabs where the deck is supplied in single span lengths (use Multideck Design software to determine suitable bottom bar requirements)

# Multideck 50-V2

## Fire Resistance Load Tables

### Dramix® Reinforced Concrete (20kg/m<sup>3</sup> RC-80/60-BN)



Multideck 50-V2

#### 1 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)						
	Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0
101	5.61	4.67	4.36	3.95	3.70	3.40	3.16
110	5.77	4.84	4.52	4.09	3.84	3.54	3.30
120	5.92	5.01	4.69	4.26	4.01	3.70	3.45
130	6.08	5.16	4.84	4.42	4.16	3.84	3.59
140	6.23	5.34	5.01	4.58	4.32	3.99	3.73
150	6.39	5.50	5.18	4.74	4.48	4.14	3.88
160	6.53	5.66	5.33	4.89	4.63	4.29	4.02
170	6.69	5.82	5.49	5.05	4.78	4.44	4.16
180	6.83	5.96	5.64	5.20	4.92	4.58	4.30
190	6.98	6.12	5.80	5.35	5.07	4.72	4.44
200	7.09	6.25	5.93	5.48	5.20	4.85	4.56

#### 1.5 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)						
	Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0
110	3.92	3.30	3.09	2.80	2.63	2.43	2.27
120	4.10	3.47	3.25	2.96	2.79	2.57	2.41
130	4.27	3.64	3.42	3.12	2.94	2.72	2.54
140	4.43	3.80	3.57	3.27	3.09	2.85	2.67
150	4.59	3.95	3.72	3.41	3.22	2.98	2.80
160	4.74	4.11	3.88	3.56	3.37	3.13	2.93
170	4.88	4.25	4.02	3.70	3.50	3.25	3.05
180	5.00	4.38	4.14	3.82	3.62	3.37	3.16
190	5.16	4.52	4.29	3.96	3.76	3.50	3.29
200	5.30	4.67	4.43	4.10	3.90	3.63	3.41

#### 2.0 Hour Fire Rating - Normal Weight Concrete

Slab Depth (mm)	Span (m)						
	Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0
125	3.80	3.23	3.03	2.77	2.61	2.41	2.25
130	3.88	3.31	3.11	2.84	2.68	2.48	2.31
140	4.06	3.48	3.27	3.00	2.83	2.62	2.45
150	4.21	3.63	3.42	3.14	2.97	2.75	2.58
160	4.37	3.78	3.57	3.28	3.10	2.88	2.70
170	4.49	3.91	3.70	3.41	3.23	3.00	2.81
180	4.63	4.05	3.83	3.53	3.35	3.12	2.93
190	4.80	4.22	4.00	3.70	3.50	3.27	3.07
200	4.94	4.36	4.13	3.83	3.63	3.39	3.19

**Notes:**

These tables are not applicable to slabs where the deck is supplied in single span lengths (use Multideck Design software to determine suitable bottom bar requirements)

# Multideck 50-V2

## Fire Resistance Load Tables

### Dramix<sup>®</sup> Reinforced Concrete (20kg/m<sup>3</sup> RC-80/60-BN)

#### 1 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 0.9mm							Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
100	5.37	4.38	4.05	3.63	3.40	3.11	2.88	5.59	4.55	4.22	3.79	3.54	3.23	3.01
110	5.56	4.55	4.23	3.80	3.55	3.26	3.02	5.77	4.73	4.39	3.95	3.70	3.38	3.14
120	5.77	4.76	4.42	3.99	3.73	3.43	3.19	5.97	4.93	4.58	4.13	3.87	3.55	3.30
130	5.98	4.96	4.63	4.18	3.91	3.59	3.34	6.18	5.13	4.78	4.32	4.05	3.72	3.46
140	6.19	5.17	4.82	4.37	4.09	3.77	3.51	6.38	5.34	4.98	4.51	4.23	3.89	3.62
150	6.38	5.36	5.01	4.55	4.27	3.93	3.66	6.58	5.53	5.16	4.69	4.41	4.05	3.78
160	6.56	5.55	5.19	4.72	4.44	4.09	3.81	6.75	5.70	5.34	4.85	4.56	4.20	3.92
170	6.73	5.72	5.36	4.88	4.60	4.24	3.96	6.93	5.89	5.52	5.02	4.73	4.37	4.07
180	6.91	5.89	5.53	5.05	4.75	4.39	4.10	7.10	6.05	5.69	5.19	4.89	4.52	4.22
190	7.09	6.07	5.71	5.22	4.92	4.55	4.25	7.26	6.22	5.84	5.34	5.04	4.66	4.35
200	7.24	6.23	5.87	5.37	5.07	4.69	4.39	7.42	6.38	6.01	5.51	5.20	4.80	4.50

#### 1.5 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 0.9mm							Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
105	3.88	3.17	2.95	2.65	2.48	2.27	2.12	3.96	3.24	3.01	2.71	2.54	2.33	2.16
110	3.98	3.27	3.03	2.73	2.56	2.35	2.19	4.08	3.35	3.11	2.80	2.63	2.41	2.24
120	4.19	3.46	3.22	2.91	2.73	2.50	2.33	4.29	3.55	3.30	2.98	2.79	2.56	2.38
130	4.37	3.63	3.38	3.06	2.88	2.64	2.46	4.47	3.72	3.47	3.14	2.95	2.70	2.52
140	4.56	3.82	3.57	3.23	3.04	2.80	2.61	4.66	3.91	3.65	3.30	3.10	2.86	2.66
150	4.75	3.99	3.73	3.39	3.19	2.94	2.74	4.83	4.07	3.80	3.45	3.25	2.99	2.79
160	4.92	4.16	3.90	3.55	3.34	3.08	2.88	5.02	4.24	3.98	3.62	3.41	3.14	2.93
170	5.09	4.32	4.05	3.70	3.48	3.21	3.00	5.20	4.43	4.15	3.78	3.56	3.29	3.08
180	5.27	4.50	4.23	3.86	3.63	3.36	3.14	5.36	4.58	4.30	3.92	3.70	3.42	3.20
190	5.40	4.63	4.36	3.98	3.76	3.48	3.26	5.51	4.73	4.45	4.06	3.84	3.55	3.32
200	5.59	4.82	4.54	4.16	3.93	3.63	3.41	5.66	4.88	4.59	4.21	3.98	3.69	3.45

#### 2.0 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)													
	Gauge 0.9mm							Gauge 1.0mm						
	Total Applied Load (kN/m <sup>2</sup> )							Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0	2.0	4.0	5.0	6.7	8.0	10.0	12.0
115	3.74	3.09	2.87	2.59	2.42	2.23	2.07	3.82	3.16	2.94	2.65	2.48	2.28	2.12
120	3.86	3.19	2.97	2.68	2.52	2.31	2.15	3.93	3.25	3.02	2.73	2.56	2.35	2.20
130	4.04	3.37	3.14	2.84	2.66	2.45	2.28	4.13	3.44	3.20	2.91	2.73	2.51	2.34
140	4.24	3.55	3.32	3.01	2.83	2.60	2.43	4.33	3.63	3.38	3.07	2.88	2.66	2.48
150	4.41	3.72	3.48	3.16	2.97	2.73	2.55	4.49	3.78	3.54	3.21	3.02	2.78	2.60
160	4.61	3.90	3.65	3.32	3.13	2.88	2.70	4.67	3.95	3.70	3.38	3.17	2.93	2.73
170	4.76	4.05	3.80	3.46	3.26	3.01	2.81	4.83	4.11	3.85	3.52	3.30	3.05	2.85
180	4.95	4.23	3.98	3.63	3.42	3.16	2.96	5.04	4.30	4.05	3.70	3.48	3.22	3.01
190	5.11	4.38	4.13	3.77	3.56	3.30	3.09	5.19	4.45	4.19	3.84	3.62	3.34	3.13
200	5.32	4.59	4.32	3.95	3.73	3.46	3.24	5.35	4.61	4.34	3.98	3.76	3.48	3.26

#### Notes:

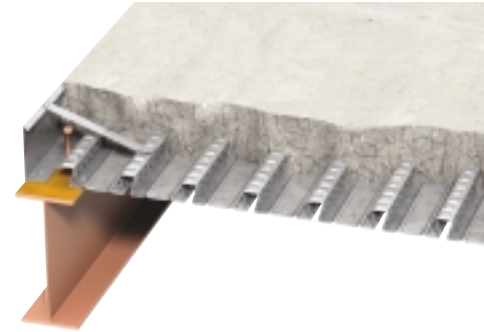
These tables are not applicable to slabs where the deck is supplied in single span lengths (use Multideck Design software to determine suitable bottom bar requirements)



# Multideck 50-V2

## Fire Resistance Load Tables

### Dramix® Reinforced Concrete (20kg/m<sup>3</sup> RC-80/60-BN)



Multideck 50-V2

#### 1 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)						
	Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0
100	6.01	4.89	4.53	4.07	3.80	3.48	3.23
110	6.20	5.08	4.71	4.24	3.97	3.63	3.38
120	6.38	5.27	4.91	4.42	4.14	3.80	3.53
130	6.57	5.47	5.09	4.60	4.31	3.96	3.69
140	6.76	5.65	5.27	4.77	4.48	4.12	3.84
150	6.94	5.84	5.45	4.95	4.65	4.28	3.99
160	7.13	6.02	5.64	5.13	4.82	4.45	4.14
170	7.29	6.20	5.80	5.29	4.98	4.59	4.29
180	7.46	6.38	5.98	5.46	5.14	4.75	4.44
190	7.63	6.54	6.15	5.62	5.30	4.90	4.58
200	7.78	6.70	6.30	5.77	5.45	5.05	4.72

#### 1.5 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)						
	Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0
105	4.16	3.41	3.17	2.85	2.67	2.45	2.27
110	4.27	3.52	3.26	2.94	2.75	2.52	2.35
120	4.48	3.71	3.45	3.12	2.92	2.68	2.50
130	4.66	3.88	3.63	3.28	3.08	2.83	2.63
140	4.86	4.07	3.80	3.45	3.23	2.98	2.78
150	5.03	4.24	3.97	3.60	3.39	3.12	2.91
160	5.20	4.41	4.13	3.76	3.53	3.26	3.04
170	5.38	4.59	4.30	3.92	3.70	3.41	3.19
180	5.54	4.73	4.45	4.06	3.83	3.54	3.31
190	5.70	4.89	4.60	4.21	3.97	3.67	3.44
200	5.84	5.04	4.74	4.35	4.11	3.80	3.56

#### 2.0 Hour Fire Rating - Lightweight Concrete

Slab Depth (mm)	Span (m)						
	Gauge 1.2mm						
	Total Applied Load (kN/m <sup>2</sup> )						
	2.0	4.0	5.0	6.7	8.0	10.0	12.0
115	3.99	3.30	3.06	2.77	2.59	2.38	2.21
120	4.09	3.39	3.16	2.85	2.67	2.45	2.29
130	4.30	3.58	3.34	3.02	2.84	2.61	2.43
140	4.48	3.75	3.51	3.18	2.98	2.75	2.56
150	4.63	3.90	3.65	3.32	3.12	2.88	2.68
160	4.84	4.09	3.84	3.49	3.29	3.03	2.84
170	4.98	4.24	3.98	3.63	3.42	3.16	2.95
180	5.17	4.42	4.16	3.80	3.58	3.31	3.09
190	5.34	4.59	4.32	3.95	3.73	3.45	3.23
200	5.52	4.77	4.48	4.11	3.88	3.60	3.37

**Notes:**

These tables are not applicable to slabs where the deck is supplied in single span lengths (use Multideck Design software to determine suitable bottom bar requirements)

# Estimating and Quotations

## Supply and Fix

If a fixing service is required Kingspan recommend:



**MSW (UK) Limited**

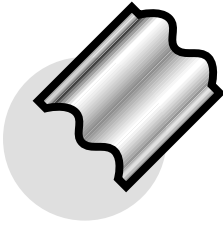
Acton Grove, Long Eaton  
Nottingham NG10 1FY

Tel: 0115 946 2316

Fax: 0115 946 2278

Email: [deck@mswukltd.co.uk](mailto:deck@mswukltd.co.uk)

Web: [www.mswukltd.co.uk](http://www.mswukltd.co.uk)



## metaldeck

**Metaldeck Limited**

Prestwood Place  
East Pimbo, Skelmersdale  
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Tel: 01695 555 070

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Email: [metaldeck@btconnect.com](mailto:metaldeck@btconnect.com)

Web: [www.metaldeck.ltd.co.uk](http://www.metaldeck.ltd.co.uk)

## Quotations

Kingspan Structural Products can provide quotations for the supply of Multideck on receipt of clients structural detail drawings and/or specifications with bills of quantities.

## Delivery

Delivery of Kingspan Multideck is made direct to site and phased in accordance with clients erection programme whenever possible. Delivery is made using Kingspan's own transport for off loading by others.

## Packing

Multideck is supplied packed in bundles of up to 1.5 tonnes banded with steel straps on timber packers at regular intervals to prevent damage during transport.

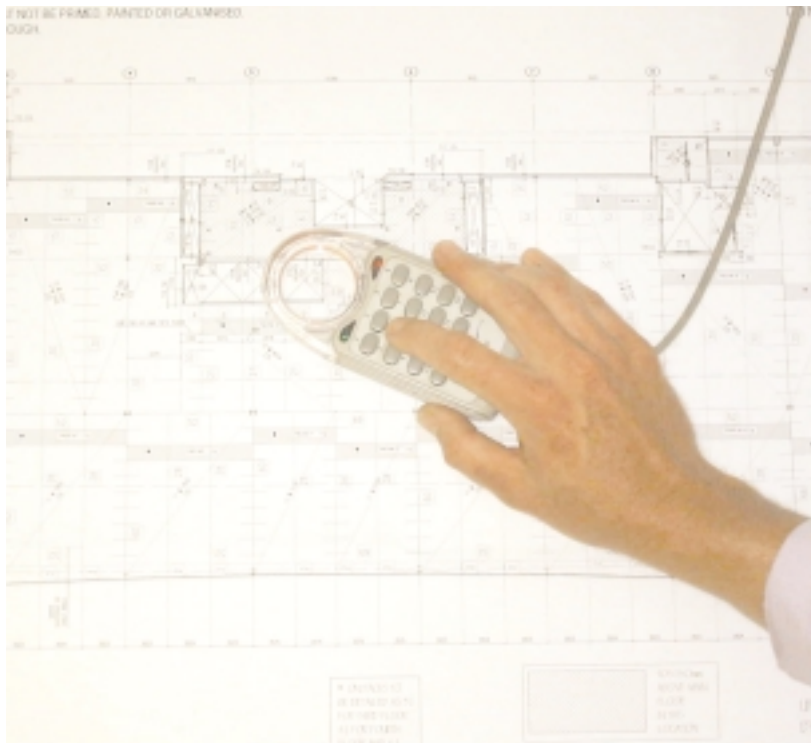
## Availability

Kingspan Multideck is normally available on a 2-3 week delivery on receipt of cutting list, but please check before ordering as this can vary with demand.

## Contact

Please contact Kingspan Multideck Sales Department by:

Tel 01944 712000 or Fax 01944 710830





# Site Handling

## Transport and Site Access

Delivery vehicles are up to 12m long with a maximum gross weight of 30 tonnes and a turning circle of 16m. They require an access road at least 4m wide and 12m of good hard standing to allow for crane-operated unloading. Standard loads will not exceed 20 tonnes

## Unloading

Unloading of vehicles on-site is the responsibility of others.

### Fork Lift Trucks

Sheets of Multideck up to 7m long can be off loaded by fork lift trucks. Sheets longer than 7m should be lifted by crane. Multideck should be placed directly onto the supporting steelwork. If this is impractical, it should be stored as recommended under 'Storage'.



Photo Courtesy of MSW (UK) Ltd.

## Deck Identification

All Multideck bundles are marked to correspond with the detail and general arrangement drawings. Identification includes floor location, grid location, deck length, gauge and direction of lay. Where possible, bundles should be lifted from the transport and placed on the support frame ready for fixing. See pages 58 & 59.

## Quality Control On-site

Quality control on site should be based on the recommendations of BS 8000: Part 2 Concrete Work.

## Storage

Multideck should be stored under cover or beneath waterproof tarpaulins, off the ground on suitable timber framing with good air circulation around the sheet. The sheets should slope to drain away any rain water which may enter the storage area.

When exposed to moisture, galvanised deck will develop a coating of zinc oxide. If left, this may reduce the degree of protection, so it is important to inspect regularly for moisture, and take immediate remedial action.

## Handling

When deck has to be lifted onto the building framework, care must be taken to avoid damage by using suitable lifting equipment. Use of unprotected chains will cause damage and are not recommended. Sheet corners must be protected as these are particularly vulnerable to damage.

Never walk on deck in the stack or before it is securely fixed in position (see also 'Safety').

Multideck sheets must not be dragged from the stack. Remove by lifting off one at a time.

## Safety

### Important

We recommend that all Multideck profiles are installed with safety nets in place.

### Handling Hazards

Multideck may have a residual protective coating when delivered and should be handled with care. See BSC HS Data Sheet 18.

### Eye Hazards

Care should be taken when breaking the strapping around bundles. Eye protectors conforming to the latest British Standard should always be worn.

### Protective Clothing

To prevent laceration of skin, contamination by oil and risks to eyes and hands, protective overalls, gloves and eye protection should be worn at all times.



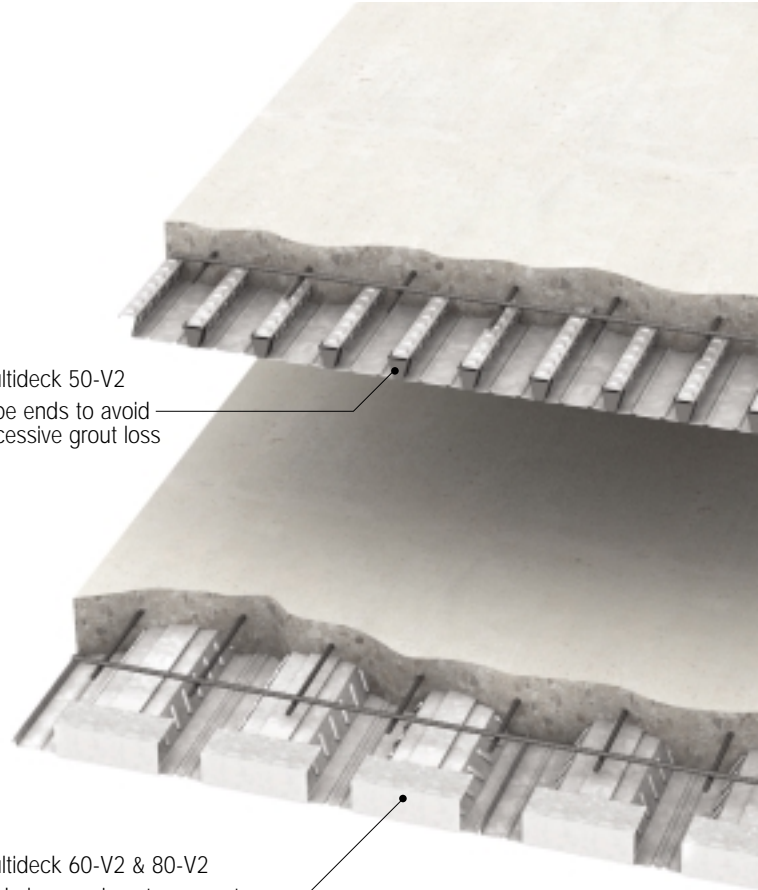
# Site Handling

## Multideck Weights

Multideck 60-V2	Self Weight
Gauge	(kg/m <sup>2</sup> )
0.9 mm	9.34
1.0 mm	10.37
1.1 mm	11.41
1.2 mm	12.45
Multideck 80-V2	Self Weight
Gauge	(kg/m <sup>2</sup> )
1.2 mm	13.83
Multideck 50-V2	Self Weight
Gauge	(kg/m <sup>2</sup> )
0.9 mm	12.89
1.0 mm	14.36
1.2 mm	17.29

Multideck 50-V2  
Tape ends to avoid  
excessive grout loss

Multideck 60-V2 & 80-V2  
End closure piece to prevent  
excessive grout loss



Matthew Boulton College, Birmingham. Photo Courtesy of MSW (UK) Ltd.

# Pack ID

These should be read in conjunction with the typical layout drawings opposite

All Multideck bundles are marked to correspond with the detail and general arrangement drawings. Identification includes floor location, grid location, deck length, gauge and direction of lay. Where possible, bundles should be lifted from the transport and placed on the support frame ready for fixing.

Packing labels and plans for Multideck are designed to make life easier on site.

## Direction of Lay

Position pack at indicated position. Orientate the pack so that the direction of lay strip faces the direction indicated on the deck layout drawing.



Pack ID

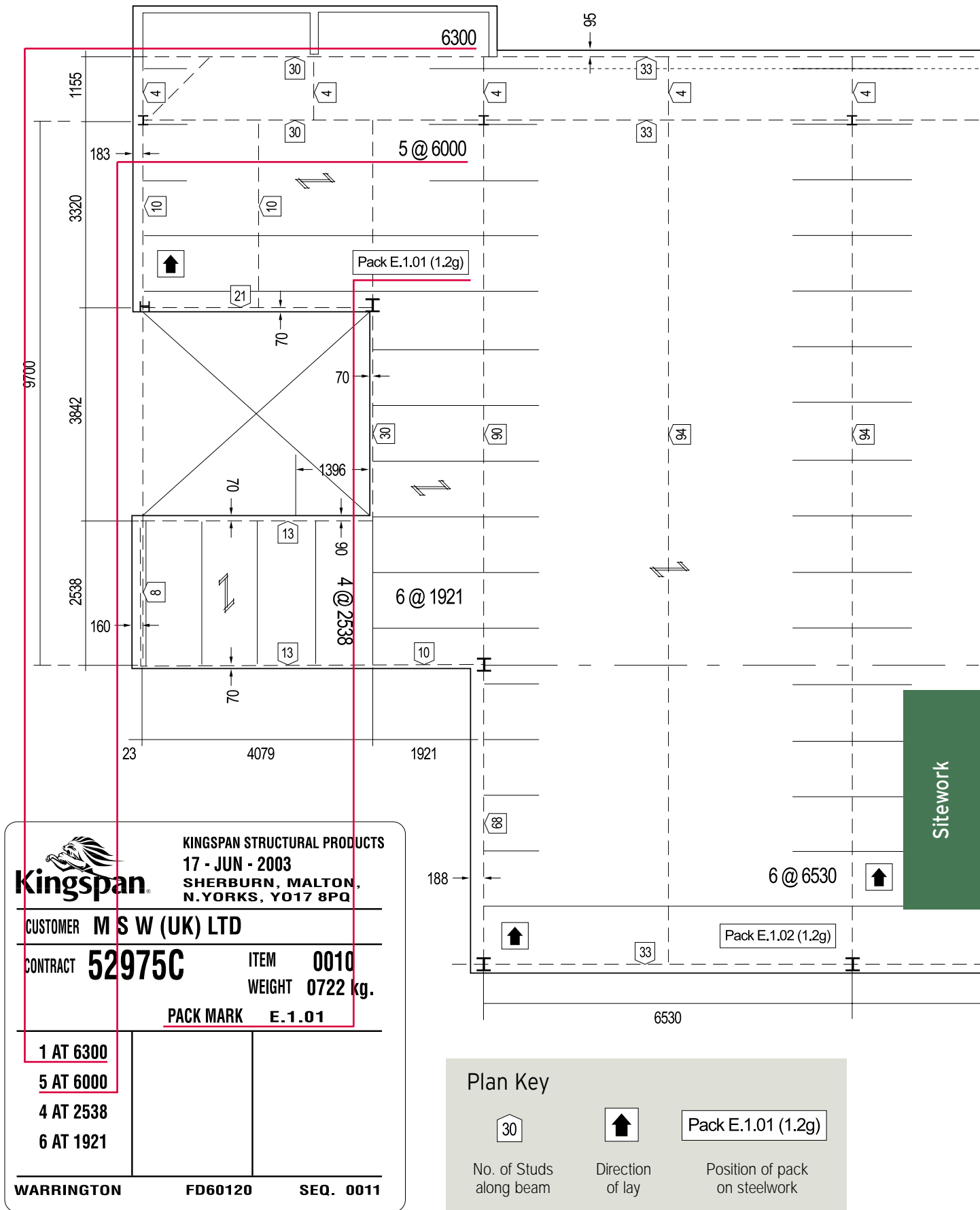


Completed deck layout from layout drawing opposite.



Citigroup Headquarters at Canary Wharf. Photo Courtesy of MSW (UK) Ltd.

Example of Typical Layout Drawing (normally provided by deck fixer)



# Primary Fixings

The supporting structure should be inspected prior to installation of Multideck to ensure that it is sound and suitable for the fixing of the Multideck product and in accordance with the detail drawings.

All primary fixings should be made through the trough in the profile. Primary fixings must always be made at the same location and centres as on the fire test specimens if regulation approval has been given on that basis.

There are a number of fixing methods which may be employed for securing the decking to the supporting structure but, in general, shot-fired pins are both fast and economical. The number of main fixings required at butt joint and intermediate positions is a minimum of two per panel.

For the initial fix to steelwork where shear studs are to be utilised Kingspan would suggest the HILTI X-EGN14MX pin or similar, in order to provide a safe working platform.

If the decking is to provide lateral restraint to the steel beams, and in the absence of through-deck welded shear studs, the fixing type should be checked for suitability. For restraint to composite beams refer to BS 5950: Part 3: Section 3.1: Appendix A.2.3.

Where decking is supported by concrete beams, gas fired fixings may still be employed, see manufacturer's literature for guidance.

For fixing to other base materials and for further information contact the fixing manufacturer.

## Hilti Fixings

Tel: 0800 886100 Fax: 0800 886200

No on-site gas fired pin fixings should be made before a test has been carried out to prove that the fixing system is operable.

All Multideck sheets must be laid and securely fixed to the support structure to avoid excessive deflection or dislodgement during pouring of the concrete.

### MD60-V2/80-V2

Every sheet must have one fixing in every trough at the panel ends and one fixing in lap joints at intermediate support.

### MD50-V2

Every sheet must have two fixings at the panel ends and at intermediate supports.

## Side Lap Fixings

### MD60-V2/80-V2

Fixings at mid span are required.

For spans exceeding 3m additional fixings at 1.5m maximum spacing are recommended.

Teks 4.8mm diameter by 20mm long self drill, self tap screws are recommended.

### MD50-V2

Fixings at mid span are not normally required.



# Shear Studs

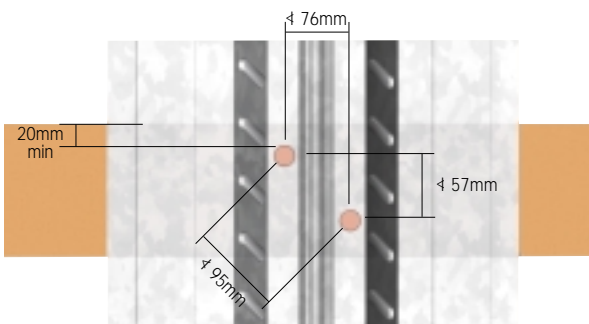
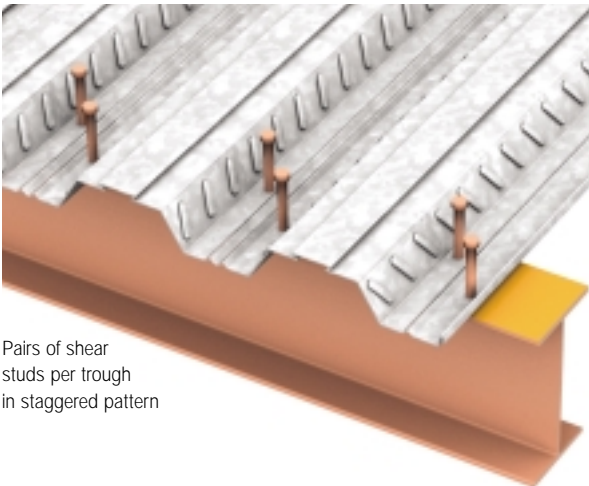
## Through Deck Stud Welding

The studs quoted are 19mm diameter headed shear studs of varying lengths for through deck welding, of low carbon steel with a minimum yield point of 350N/mm<sup>2</sup> and an ultimate tensile strength of 450N/mm<sup>2</sup> minimum.

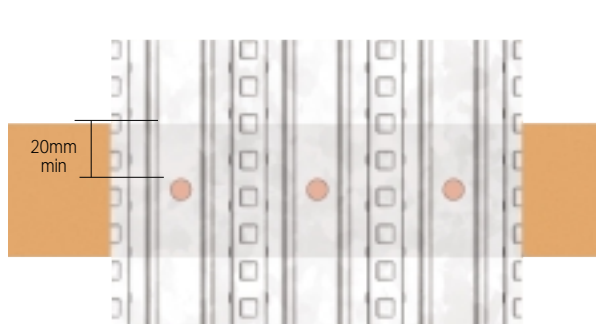
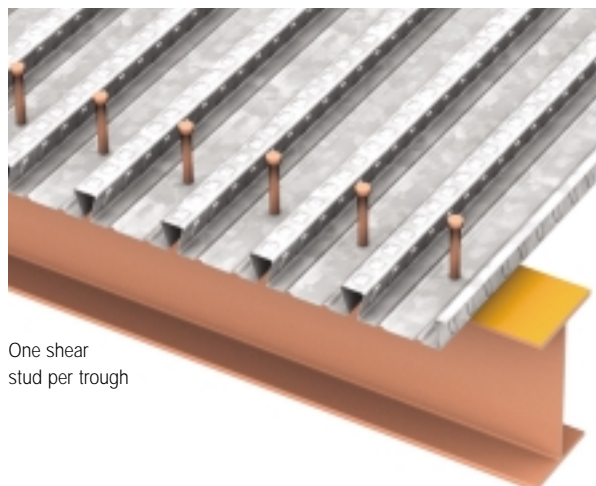
The following data is intended to be used only as a guide. Final design criteria is the responsibility of the design agency and/or a qualified design engineer.

- The flange plate thickness of the underlying beam should not be less than 7.6mm (0.4 times the stud diameter).
  - The spacing of the studs should not be less than:
    - in the direction of the shear force = 95mm.
    - transverse to the direction of shear force = 76mm.
  - The longitudinal spacing of the studs should not exceed the lesser of 600mm or 4 times the slab depth.
  - Where studs are required to be through-deck welded across the line of span of the decking, they must be spaced to suit the configuration of the deck profile.
  - The distance between the edge of a stud and the edge of the steel beam flange should not be less than 20mm.
  - The concrete cover over the stud should not be less than 15mm.  
If the cover is required to protect the connector against corrosion it should not be less than 20mm.
  - The studs after welding should extend not less than 35mm above the top flange of the steel deck i.e.
    - Multideck 60-V2 use standard stud length 95mm L.A.W.,
    - Multideck 80-V2 use standard stud length 120mm L.A.W.,
    - Multideck 50-V2 use standard stud length 95mm L.A.W.
  - The top flanges of the beam must be unpainted if studs are to be used.
  - Welding equipment should be of NELSON manufacture or similar with a minimum of 200 KVA diesel generator, or mains power at 415V 3-phase fused at 100A per phase.
  - Where studs are required for composite beam action strength reduction factors should be calculated to BS 5950: Part 3: Section 3.1.
- N.B. The flange of the supporting beam must be of a sufficient width where shear studs are provided in pairs.

## Stud Positioning - Multideck 60-V2/80-V2



## Stud Positioning - Multideck 50-V2





Kingspan Multideck  
was used in the construction of  
The Citigroup Headquarters in Canary Wharf.

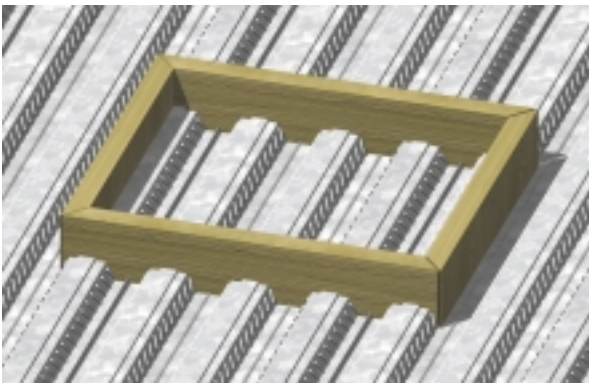
# Forming Holes

## Formation of Holes in Multideck Floor Slabs

The following empirical rules are based on recommendations as given in the Concrete Society report on standard details and the Steel Construction Institute publication "Good Practice in Composite Floor Construction".

## Structural Limitations

Where the slab is supporting uniformly distributed loads the following rules may be applied. If concentrated or line loads exist adjacent to holes a special analysis may be required.



Timber shutter

Holes should be formed after the slab is cast, shutters being used to make a void in the concrete.

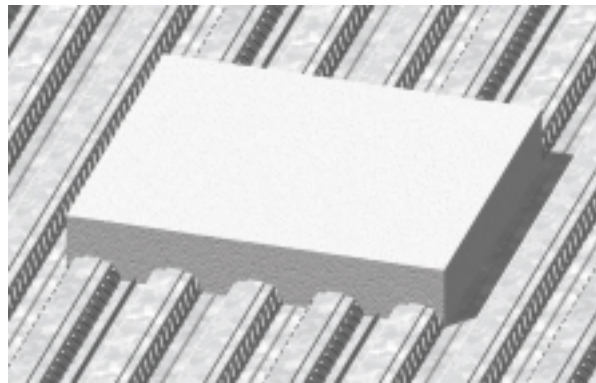
1. No hole should be closer than its width to an unsupported edge.
2. The maximum width of hole measured transversely to the span of the slab should not be greater than 700mm without additional trimming support beams.
3. In any 4m width of slab measured transversely to the span of the slab, not more than 1/4 of the slab width should be removed by all holes in the span under consideration. For slabs less than 4m wide the permissible width of holes should be reduced proportionately.
4. The length of hole measured parallel to the slab span should not be greater than 1/4 of the span without provision of trimming support beams.
5. When the distance between holes is less than 1 1/2 times the width of the largest opening, the group of holes should be considered as a single hole with an effective length of width taken as the perimeter of the group.

The following information is for guidance only. The design and detailing of additional trimming reinforcement around voids is the responsibility of the engineer.

## Construction Details

1. Holes not trimmed by supporting beams should be boxed out with the formwork prior to concreting and the hole in the deck should not be cut until the concrete has achieved at least 75% of its design strength.

2. Holes up to 300mm square will not require additional reinforcement or trimming beams.
3. Holes over 300mm square up to 500mm square will require the following additional reinforcement if trimming support beams are not provided.
  - a. One T 20 bar in each trough either side of the hole (or multiple smaller bars giving equivalent area).
  - b. One T 20 bar across each end of the hole on the deck transverse to the slab span (or multiple smaller bars giving equivalent area).



Dense polystyrene blocks

- c. Two additional high yield bars of the same diameter as the mesh parallel to each edge of the hole at mesh level. All reinforcing bars should extend an anchorage length beyond the edges of the hole.
4. Holes over 500mm square up to 700mm square will require the following additional reinforcement trimming if support beams are not provided.
  - a. One T 25 bar in each trough either side of the hole (or multiple smaller bars giving the equivalent area).
  - b. One T 25 bar across each end of the hole on the deck transverse to the span (or multiple smaller bars giving equivalent area).
  - c. Where the slab thickness is less than 200mm, provide one T 25 bar diagonally across each corner of the opening between the bottom transverse bars and the mesh (or multiple smaller bars giving equivalent area).
  - d. Where the slab thickness is greater than or equal to 200mm provide one T 25 bar diagonally across each corner of the opening both immediately above the bottom transverse bars and also under the top mesh (or multiple smaller bars giving equivalent area).
  - e. Three additional high yield bars of the same diameter as the mesh across each edge of the hole at mesh level.
5. Holes over 700mm square will require trimming support beams around the opening.

# Temporary Supports

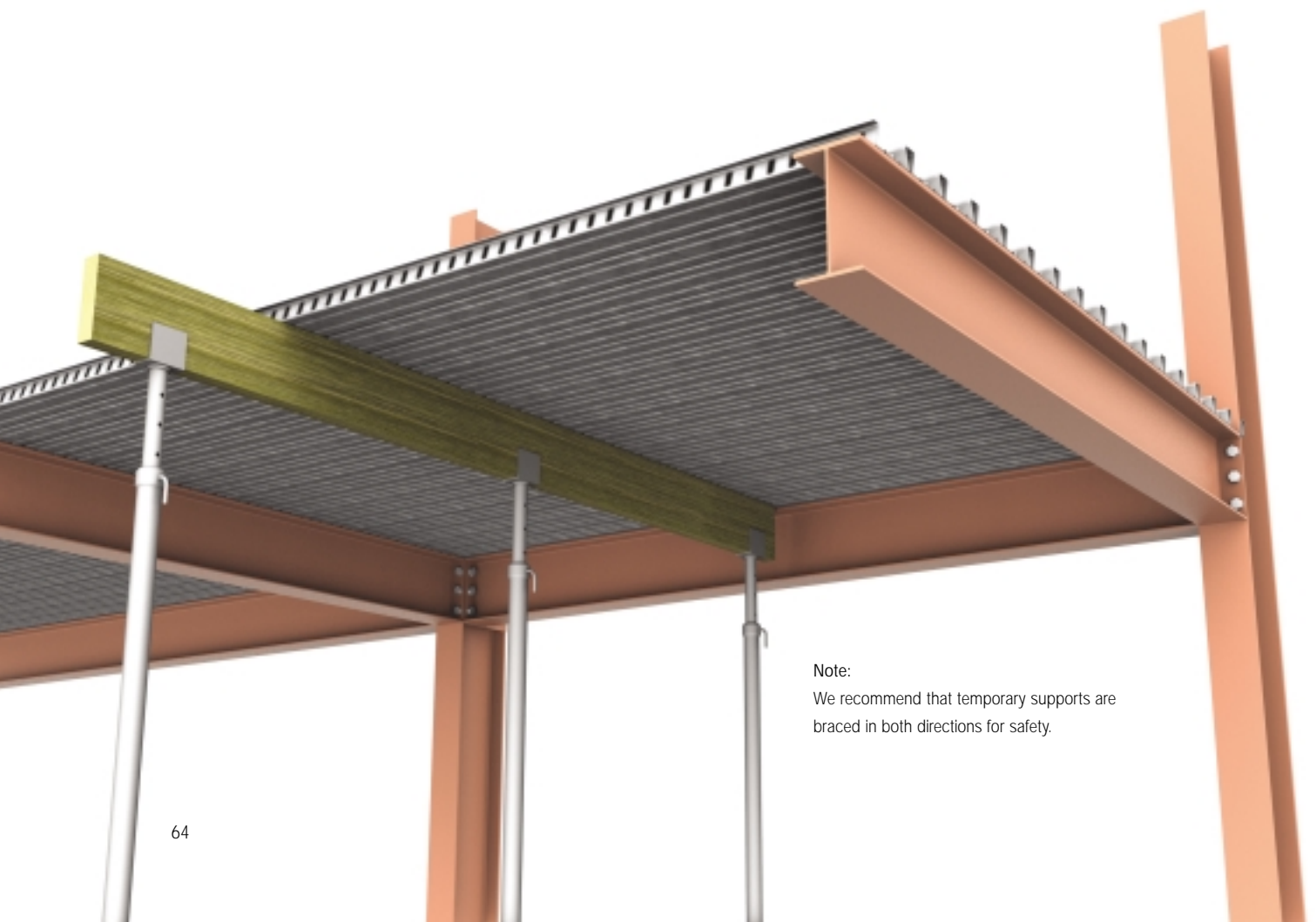
## Do I Need to Prop?

Decking is usually designed to be unpropped. For longer spans temporary propping may be required. There may be small areas in a building where propping is necessary, even when the main areas of the floor remain unpropped. These propped areas may include bays that are in-filled after the removal of climbing cranes, or lifts shafts which have non-standard span lengths. On large spans it may be necessary to install the props prior to laying the deck. The decking layout drawings should show the extent and lines of temporary supports.

Normally, props are placed at either mid-span (one line of props) or at third points (2 lines of props) within a span. The decking sheets should never be interrupted (cut) at the location of a temporary support, and the decking should not be fastened to the temporary supports.

Props normally consist of lengths of timber and/or steel plates supported by adjustable length steel tubes ('Acrows'). The minimum bearing length of the timber and/or plates depends upon the thickness of the slab, the span length and the deck rib geometry. Bearing lengths are typically in the 75 to 100mm range. The timber bearer should be continuous, and should extend the full width of the bay.

A typical temporary support is shown in the detail below. Props of this nature are normally placed about 1.0m apart, according to the designer's requirements.



### Note:



We recommend that temporary supports are braced in both directions for safety.





# Temporary Supports

Use the tables below to determine if props are required for a given condition. If the span shown in the table is greater than the actual span on site, no temporary supports are needed. If the span shown in the table is less than your actual span, temporary supports are required.

## Normal Weight Concrete

Span Type (Support Condition)	Slab Depth (mm)	Multideck 60-V2				Multideck 80-V2			Multideck 50-V2		
		0.9	Gauge (mm)			Gauge (mm)			0.9	Gauge (mm)	
		1.0	1.1	1.2	1.0	1.1	1.2	1.0	1.2		
	100	-	-	-	-	-	-	3.00	3.08	3.34	
	110	-	-	-	-	-	-	2.91	2.99	3.24	
	120	3.26	3.39	3.52	3.62	-	-	2.82	2.91	3.15	
	130	3.15	3.28	3.40	3.50	4.03	4.13	4.22	2.75	2.83	3.07
	140	3.06	3.18	3.30	3.39	3.93	4.03	4.11	2.69	2.76	2.99
	150	2.97	3.09	3.21	3.30	3.84	3.93	4.02	2.63	2.70	2.93
	160	2.90	3.01	3.12	3.21	3.75	3.85	3.93	2.57	2.65	2.87
	175	2.79	2.91	3.02	3.10	3.65	3.74	3.82	2.49	2.57	2.78
	200	2.63	2.76	2.86	2.95	3.45	3.58	3.66	2.36	2.46	2.67
	250	2.37	2.54	2.63	2.71	3.16	3.27	3.37	2.16	2.29	2.48
	100	-	-	-	-	-	-	3.29	3.53	3.87	
	110	-	-	-	-	-	-	3.20	3.44	3.77	
	120	3.52	3.81	4.09	4.34	-	-	3.12	3.35	3.67	
	130	3.42	3.70	3.97	4.21	4.53	4.83	5.11	3.04	3.27	3.58
	140	3.32	3.60	3.86	4.10	4.39	4.68	4.95	2.96	3.19	3.50
	150	3.24	3.51	3.76	4.00	4.26	4.54	4.81	2.88	3.12	3.42
	160	3.16	3.43	3.67	3.90	4.15	4.42	4.68	2.81	3.05	3.35
	175	3.05	3.31	3.55	3.76	3.99	4.25	4.50	2.71	2.94	3.25
	200	2.87	3.14	3.36	3.57	3.76	4.01	4.24	2.57	2.79	3.10
	250	2.58	2.84	3.07	3.26	3.46	3.62	3.84	2.34	2.54	2.83

## Lightweight Concrete

Span Type (Support Condition)	Slab Depth (mm)	Multideck 60-V2				Multideck 80-V2			Multideck 50-V2		
		Deck Thickness (mm)				Deck Thickness (mm)			Deck Thickness (mm)		
		0.9	1.0	1.1	1.2	1.0	1.1	1.2	0.9	1.0	1.2
	100	-	-	-	-	-	-	-	3.22	3.31	3.57
	110	-	-	-	-	-	-	-	3.12	3.21	3.47
	120	3.46	3.64	3.74	3.82	-	-	-	3.03	3.12	3.37
	130	3.37	3.52	3.65	3.72	4.25	4.36	4.45	2.95	3.04	3.29
	140	3.28	3.42	3.54	3.64	4.14	4.25	4.34	2.88	2.97	3.21
	150	3.19	3.32	3.44	3.54	4.05	4.15	4.24	2.82	2.90	3.14
	160	3.11	3.24	3.36	3.45	3.96	4.06	4.15	2.76	2.84	3.08
	175	3.01	3.13	3.24	3.34	3.85	3.95	4.03	2.68	2.76	2.99
	200	2.86	2.97	3.08	3.17	3.69	3.79	3.87	2.57	2.65	2.87
	250	2.60	2.74	2.84	2.92	3.40	3.52	3.62	2.36	2.46	2.67
	100	-	-	-	-	-	-	-	3.49	3.74	4.10
	110	-	-	-	-	-	-	-	3.41	3.65	4.00
	120	3.72	4.04	4.33	4.59	-	-	-	3.33	3.57	3.91
	130	3.63	3.93	4.24	4.47	4.81	5.12	5.42	3.25	3.49	3.82
	140	3.54	3.84	4.11	4.36	4.67	4.98	5.27	3.18	3.41	3.74
	150	3.45	3.75	4.02	4.26	4.55	4.85	5.13	3.12	3.35	3.67
	160	3.38	3.66	3.93	4.17	4.44	4.73	5.00	3.06	3.28	3.59
	175	3.27	3.55	3.81	4.04	4.28	4.56	4.83	2.96	3.19	3.49
	200	3.12	3.38	3.62	3.85	4.06	4.32	4.58	2.81	3.05	3.35
	250	2.83	3.10	3.33	3.53	3.70	3.94	4.17	2.57	2.79	3.10

### Notes:

- Temporary supports should remain in place until the concrete has achieved 75% of its 28 day cube strength often available after 7 days. Where crack control is essential, props should not be removed until the concrete has achieved its specified design strength.
- Span values are based on 100mm minimum support widths.

# How Much Concrete Do I Need?

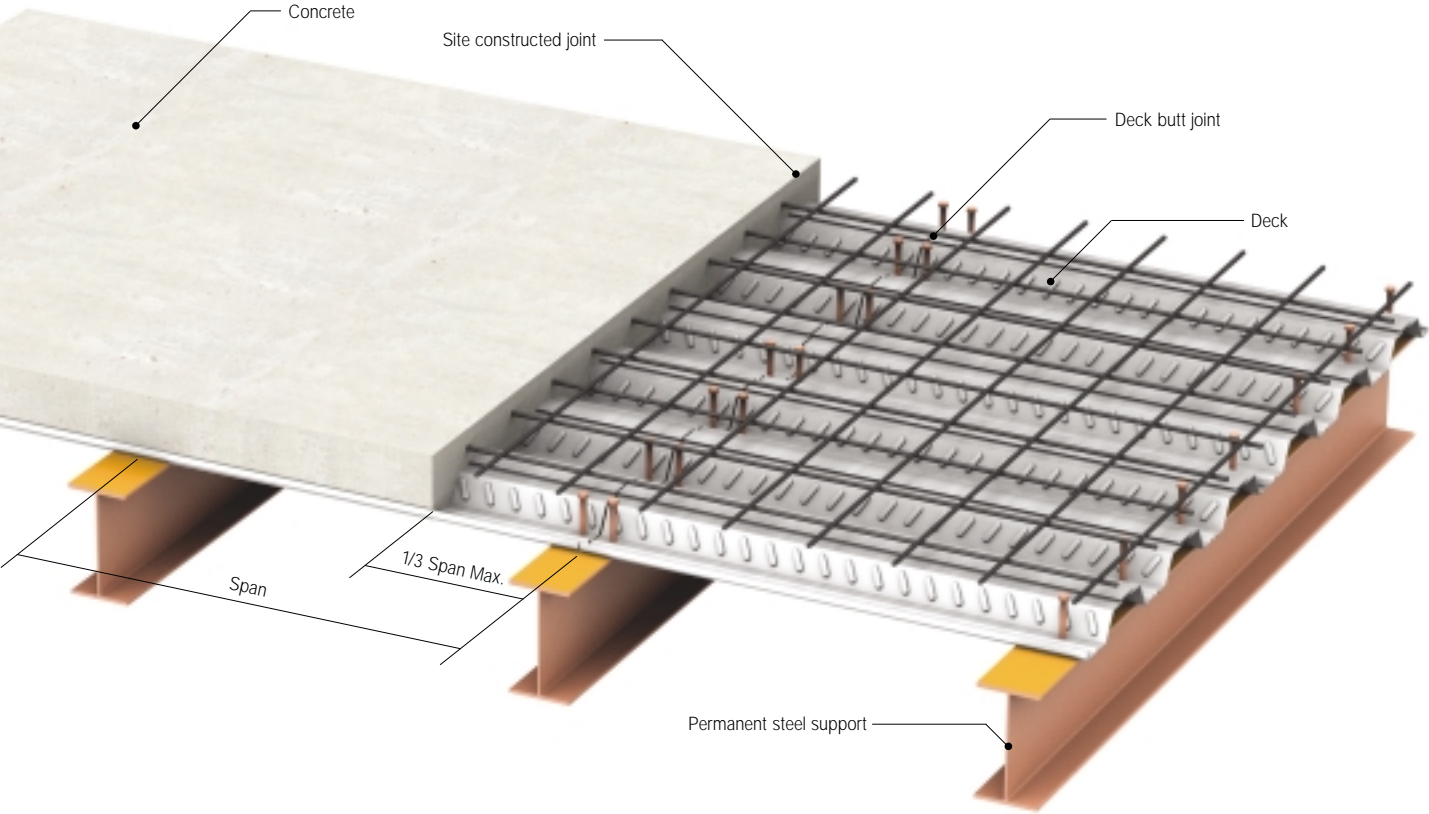
## Estimating Concrete Volumes

Multideck 60-V2		Multideck 80-V2		Multideck 50-V2	
Slab Depth (mm)	Concrete Volume (m <sup>3</sup> /m <sup>2</sup> )	Slab Depth (mm)	Concrete Volume (m <sup>3</sup> /m <sup>2</sup> )	Slab Depth (mm)	Concrete Volume (m <sup>3</sup> /m <sup>2</sup> )
100	-	100	-	100	0.091
110	-	110	-	110	0.101
120	0.085	120	-	120	0.111
125	-	125	-	125	0.116
130	0.095	130	0.082	130	0.121
140	0.105	140	0.092	140	0.131
150	0.115	150	0.102	150	0.141
160	0.125	160	0.112	160	0.151
170	-	170	-	170	0.161
175	0.140	175	0.127	175	-
200	0.165	200	0.152	200	0.191
250	0.215	250	0.202	250	0.241

Important - Concrete volumes do not take into account deflection

## Day Joints

Where it is not possible to situate a day joint over a permanent support, no more than the end third of a sheet should be left un-poured. The sub-contractor responsible for concreting can have timber closure custom made to suit.

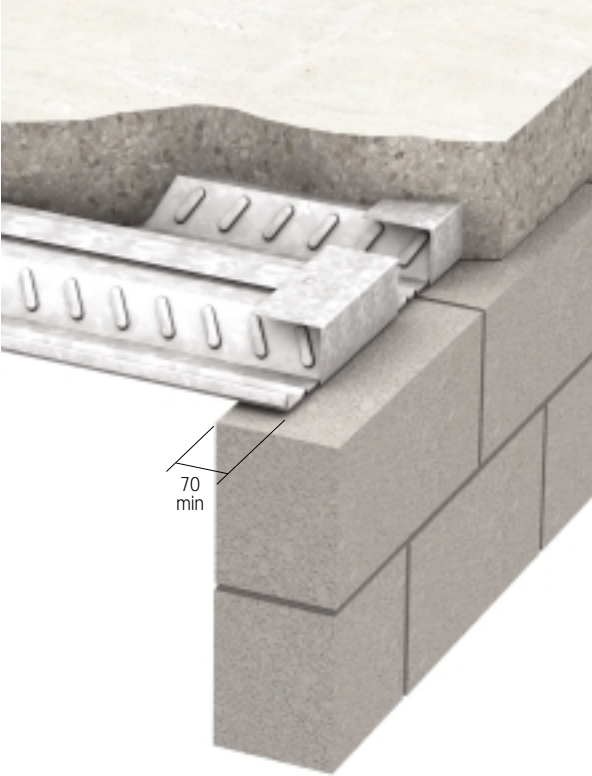




Sitework

# Minimum Bearing Surface

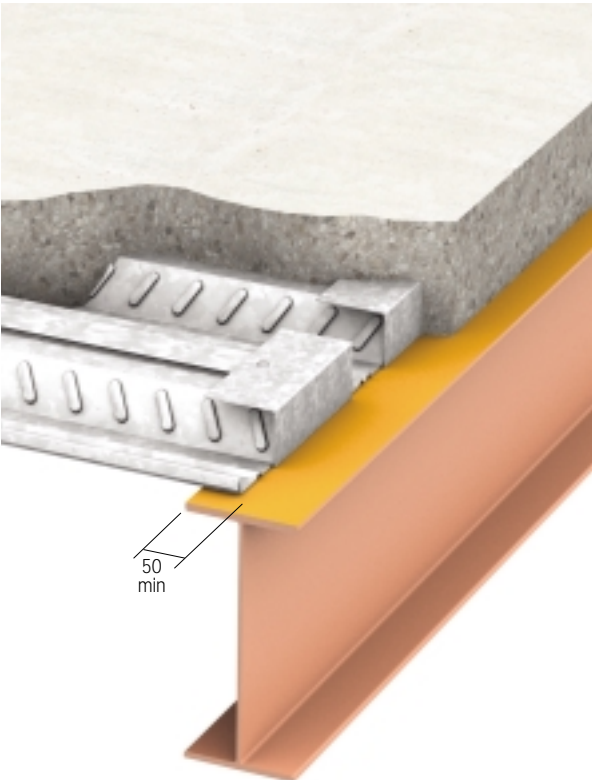
End Bearing on Brick or Blockwork Walls



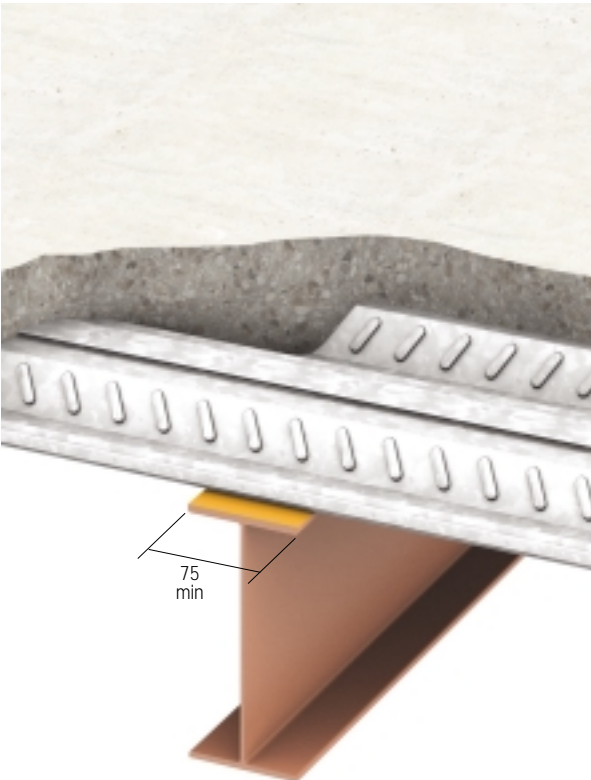
Continuous Bearing on Brick or Blockwork Walls



End Bearing on Steel or Concrete



Continuous Bearing on Steel or Concrete





Multideck packs positioned ready for fixing.  
Photo Courtesy of Metaldeck Ltd.



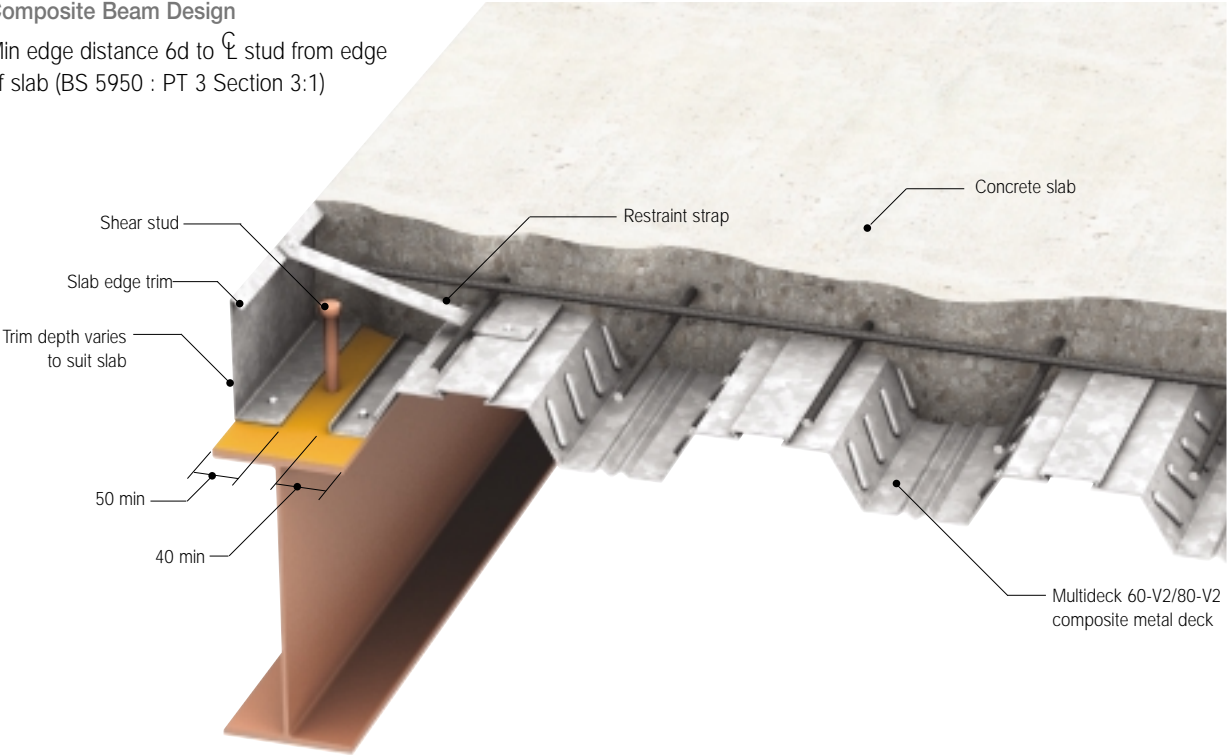
Kingspan Multideck was used in the construction of Marsden House, Bolton.  
Photo Courtesy of Metaldeck Ltd.

# Construction Details Multideck 60-V2 & 80-V2

## Side Detail

### Composite Beam Design

Min edge distance 6d to  $\bar{C}$  stud from edge of slab (BS 5950 : PT 3 Section 3:1)



## Maximum Edge Trim Cantilevers (mm)

Slab Depth (mm)	Edge Trim Gauge (mm)	
	1.2	2.0
120	126	187
130	123	183
140	121	180
150	119	177
160	117	174
175	115	170
200	-	165
250	-	156

These values are for guidance only

### Notes:

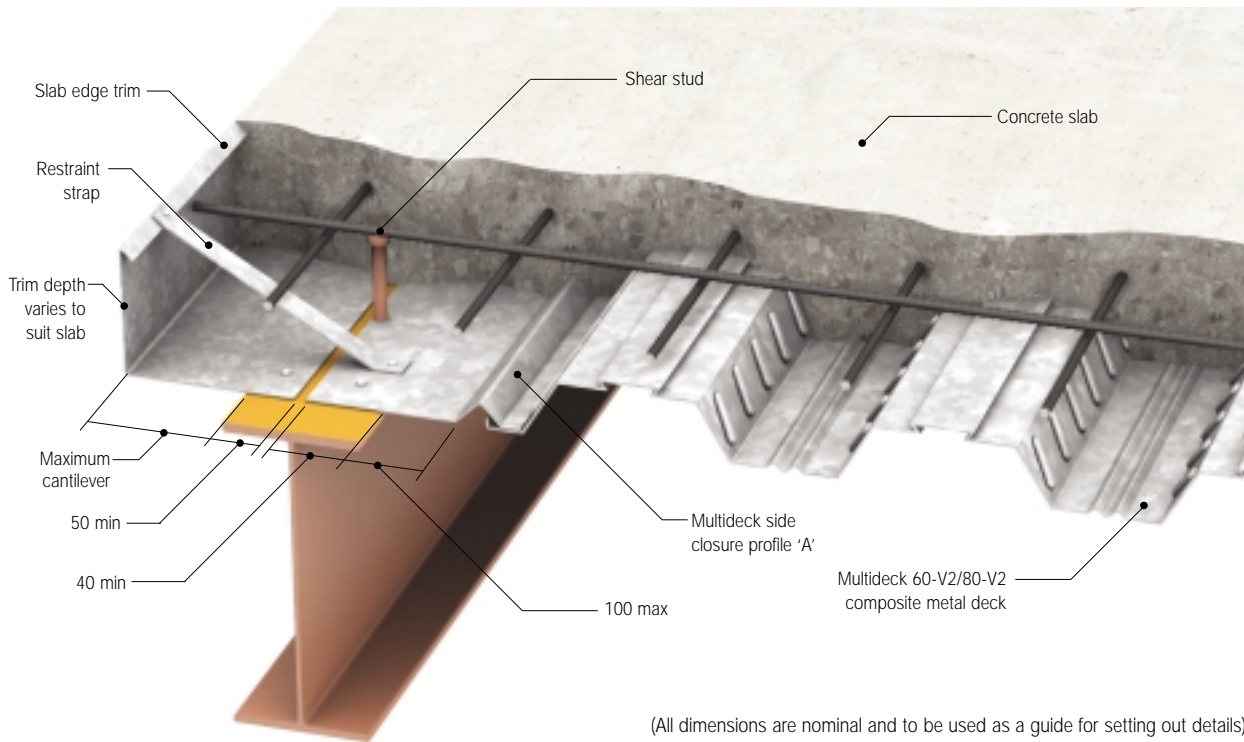
1. Deflection is limited to 3.0mm (approx) under wet weight of concrete only.
2. The table can be used for normal and lightweight concrete.
3. An allowance of 1.5kN/m<sup>2</sup> is made for construction imposed load in the bending capacity analysis.
4. Edge trim acts as permanent formwork only. Any necessary cantilever reinforcement should be designed to BS 8110 requirements.
5. We recommend that slabs of 200mm and over use 2.0mm edge trim.
6. Assumes that edge restraint straps are fixed as least every 600mm.



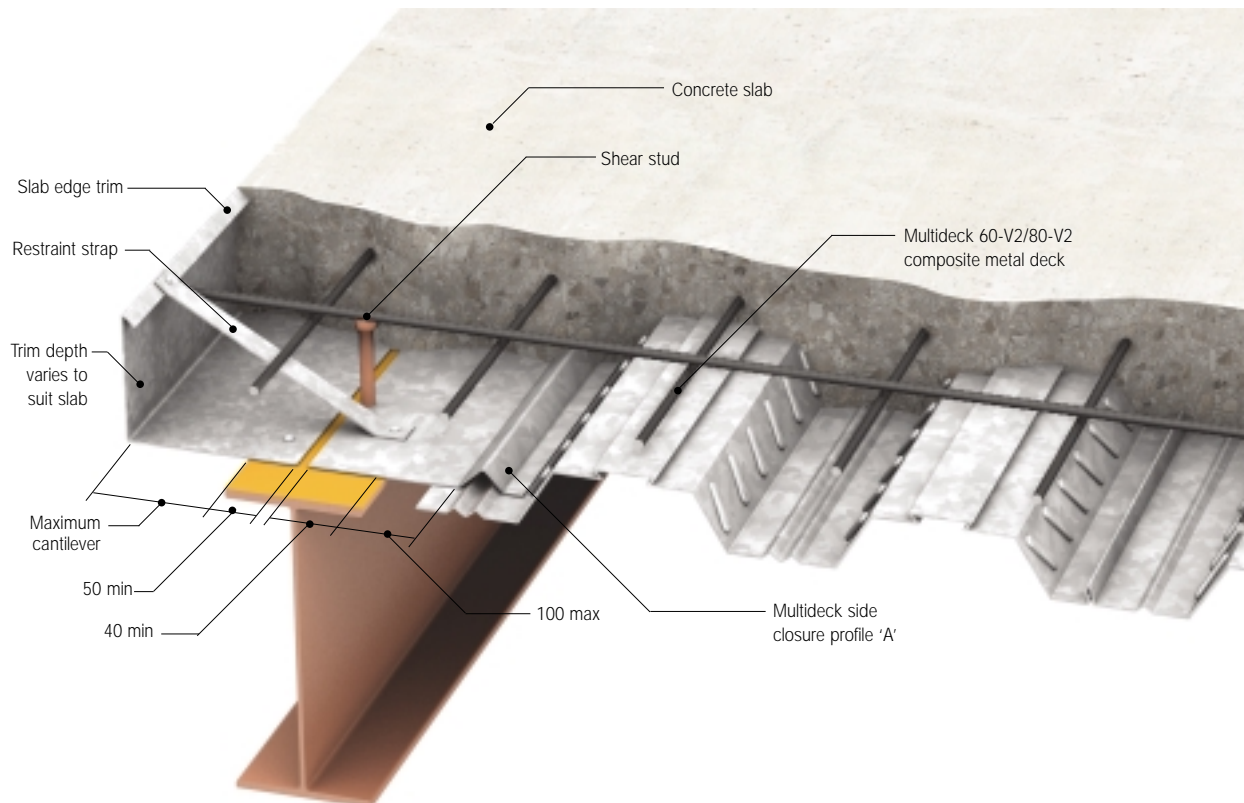
Two Towers, Arnhem, Netherlands.  
Photo Courtesy of MSW (UK) Ltd.

# Construction Details Multideck 60-V2 & 80-V2

## Side Detail using Closure Trim

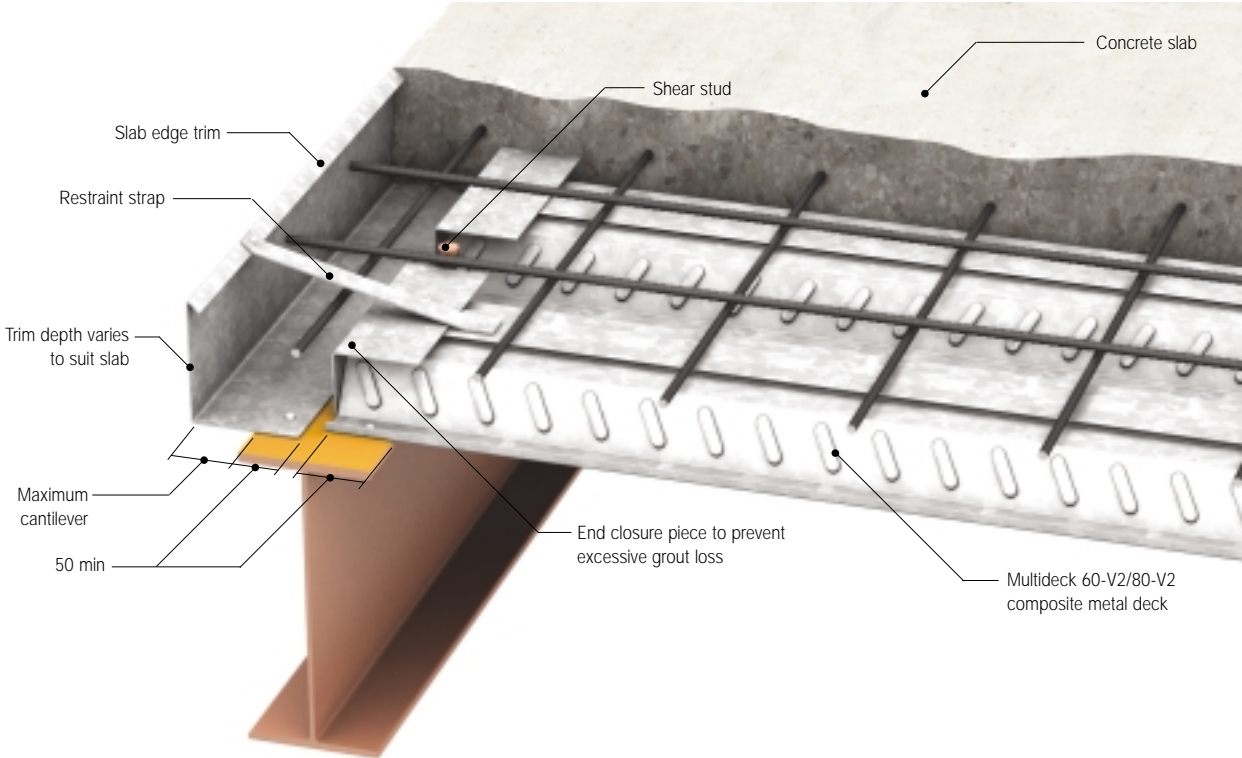


## Side Detail - Multideck Cut to Width

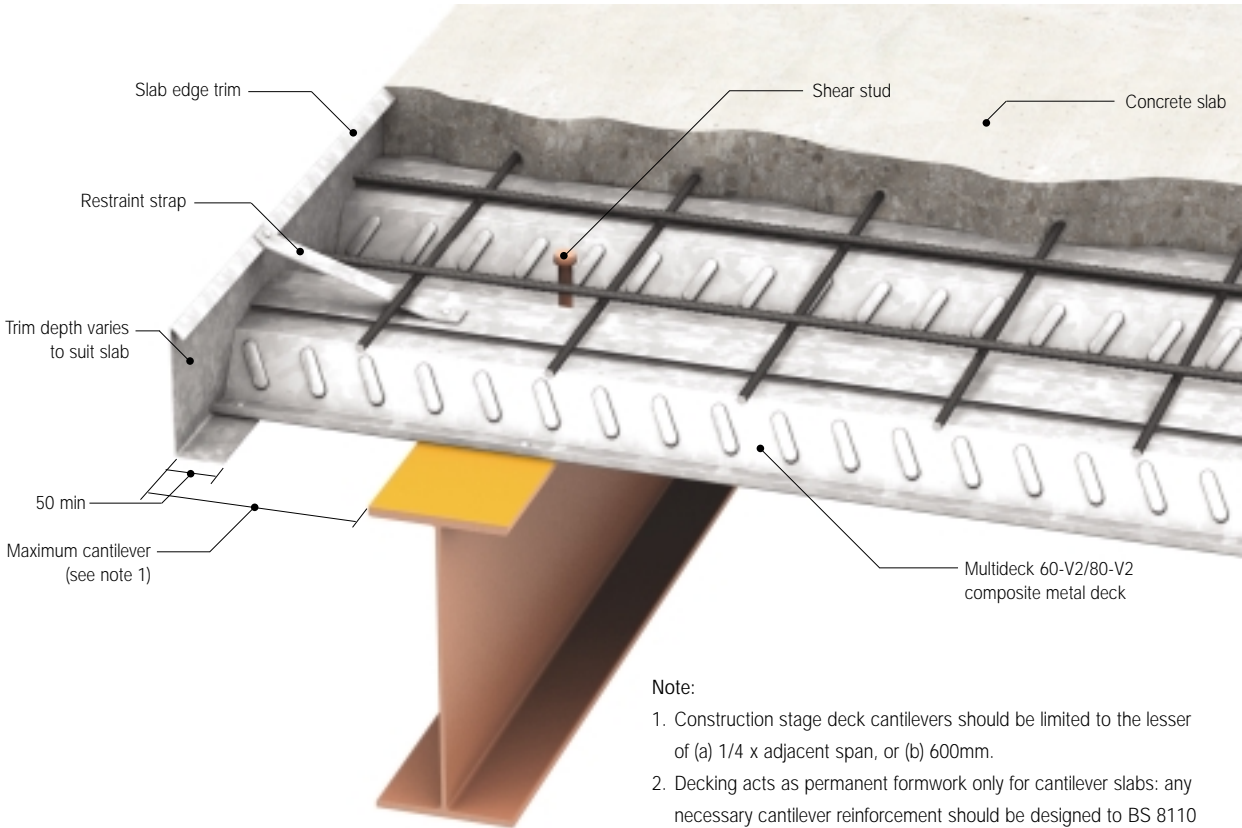


# Construction Details Multideck 60-V2 & 80-V2

## End Detail using End Closure



## End Detail Multideck Cantilever

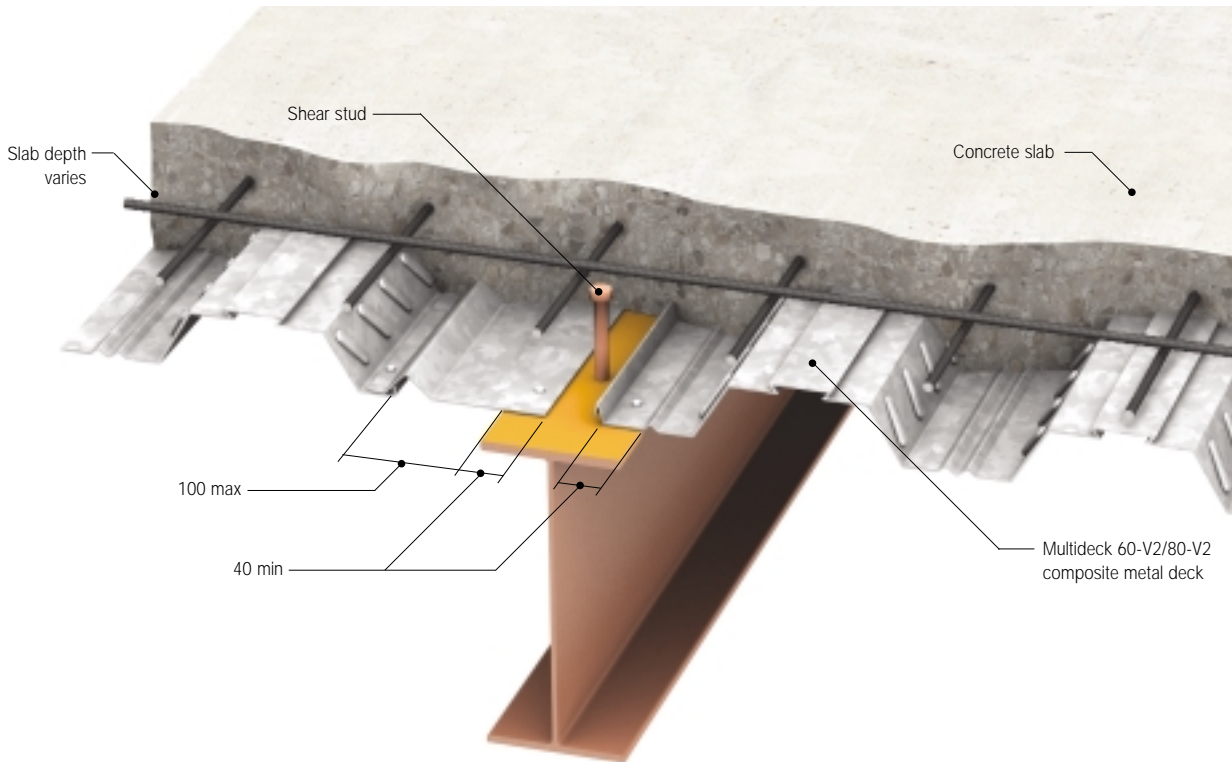


- Note:
1. Construction stage deck cantilevers should be limited to the lesser of (a) 1/4 x adjacent span, or (b) 600mm.
  2. Decking acts as permanent formwork only for cantilever slabs: any necessary cantilever reinforcement should be designed to BS 8110 requirements by the Engineer.

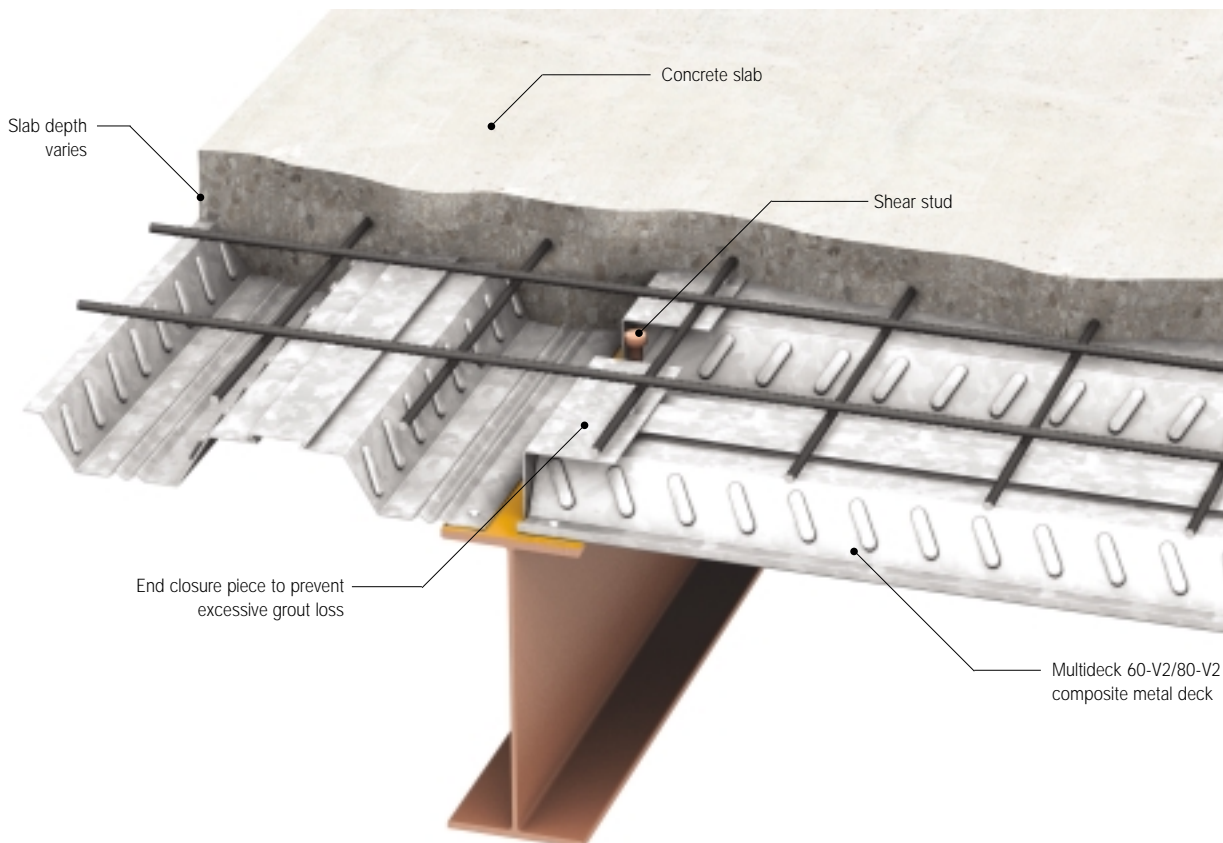


# Construction Details Multideck 60-V2 & 80-V2

## Intermediate Beam using Closure Trim

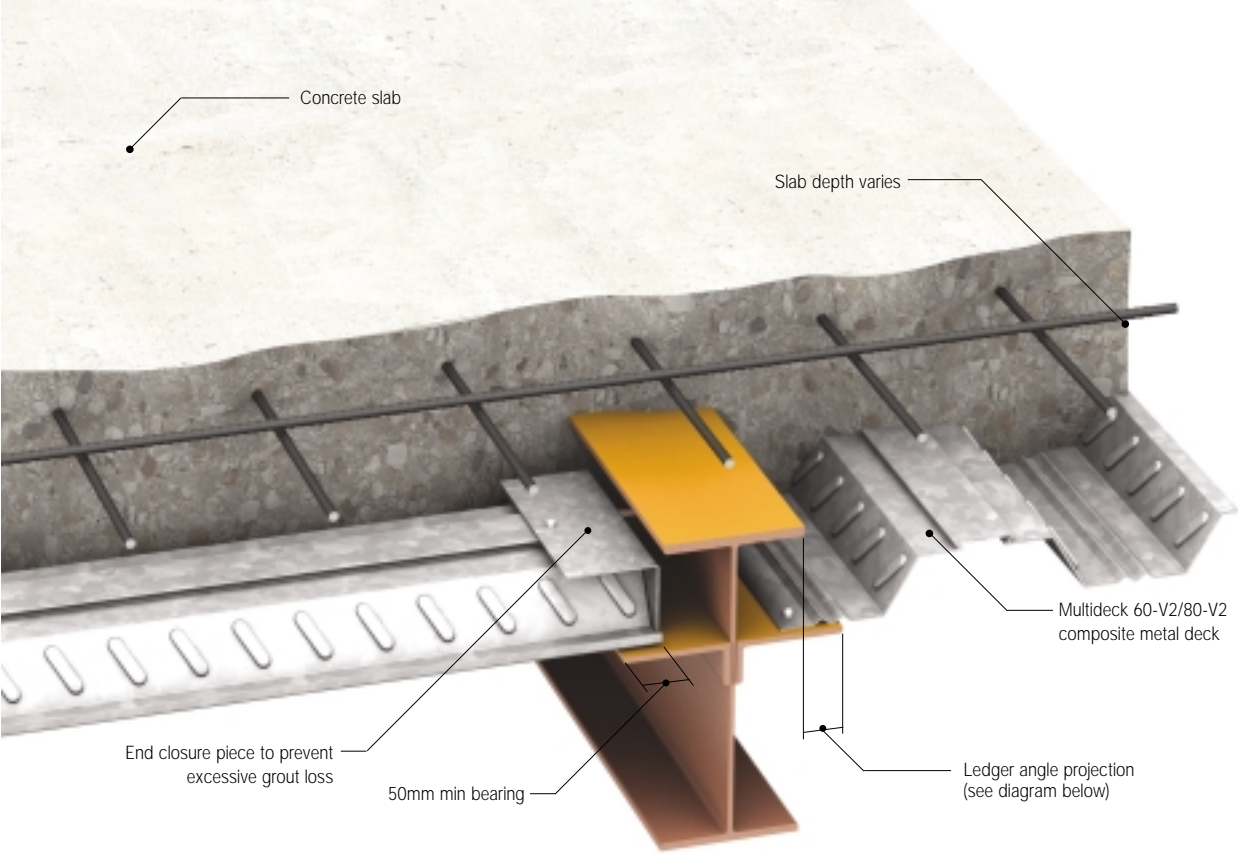


## Intermediate Beam - Change in Direction of Lay



# Construction Details Multideck 60-V2 & 80-V2

## Intermediate Beam - Change in Direction of Lay with Ledger Angle

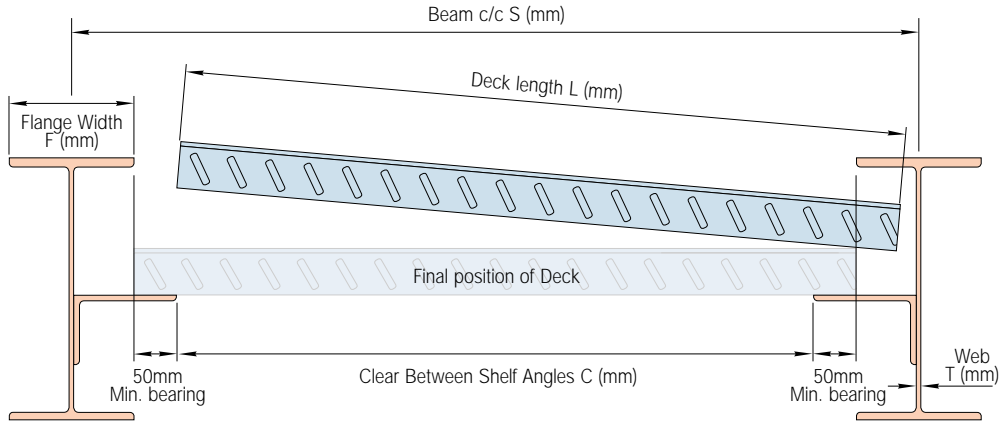


## Multideck Supported on Ledger Angles

Where Multideck is supported on ledger angles check deck length (L) required to fit and provide minimum bearing of 50mm at a each end as follows.

$$L \text{ (Max.)} = S - (F/2 + T/2 + 20\text{mm})$$

$$L \text{ (Min.)} = C + (50 \times 2)$$

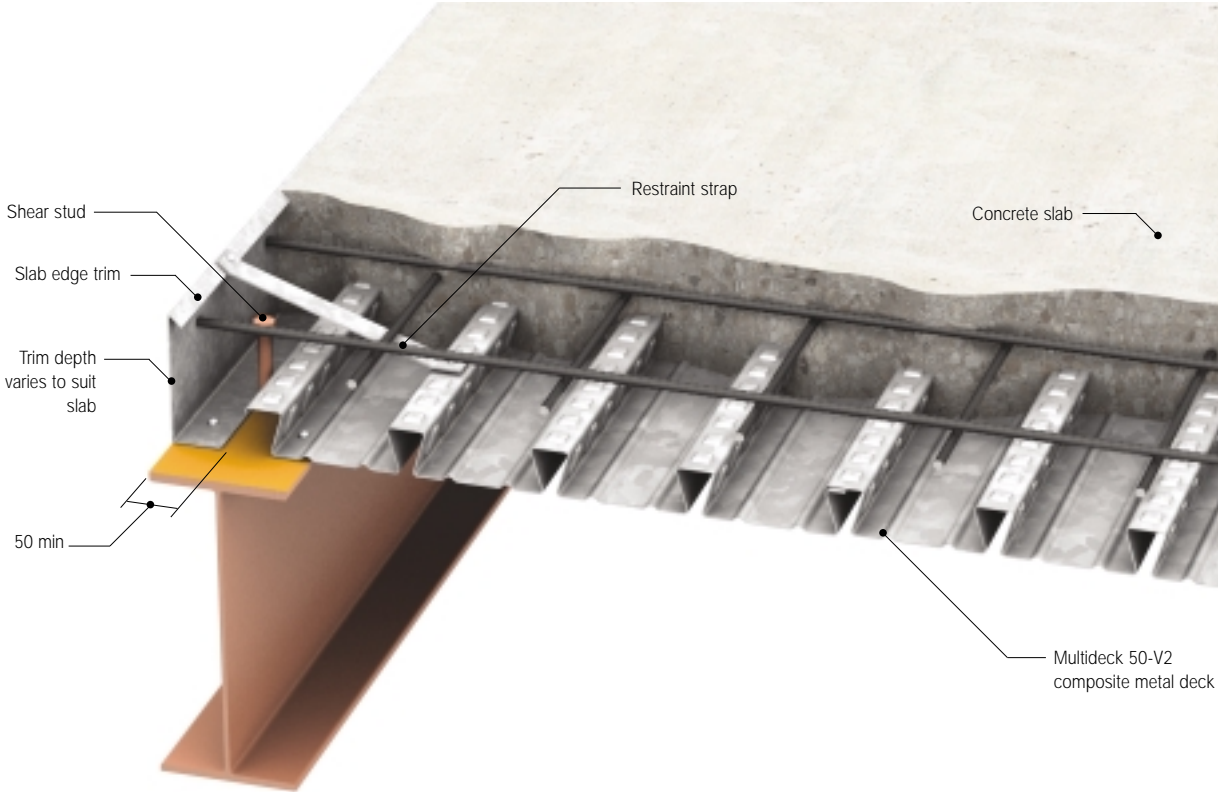




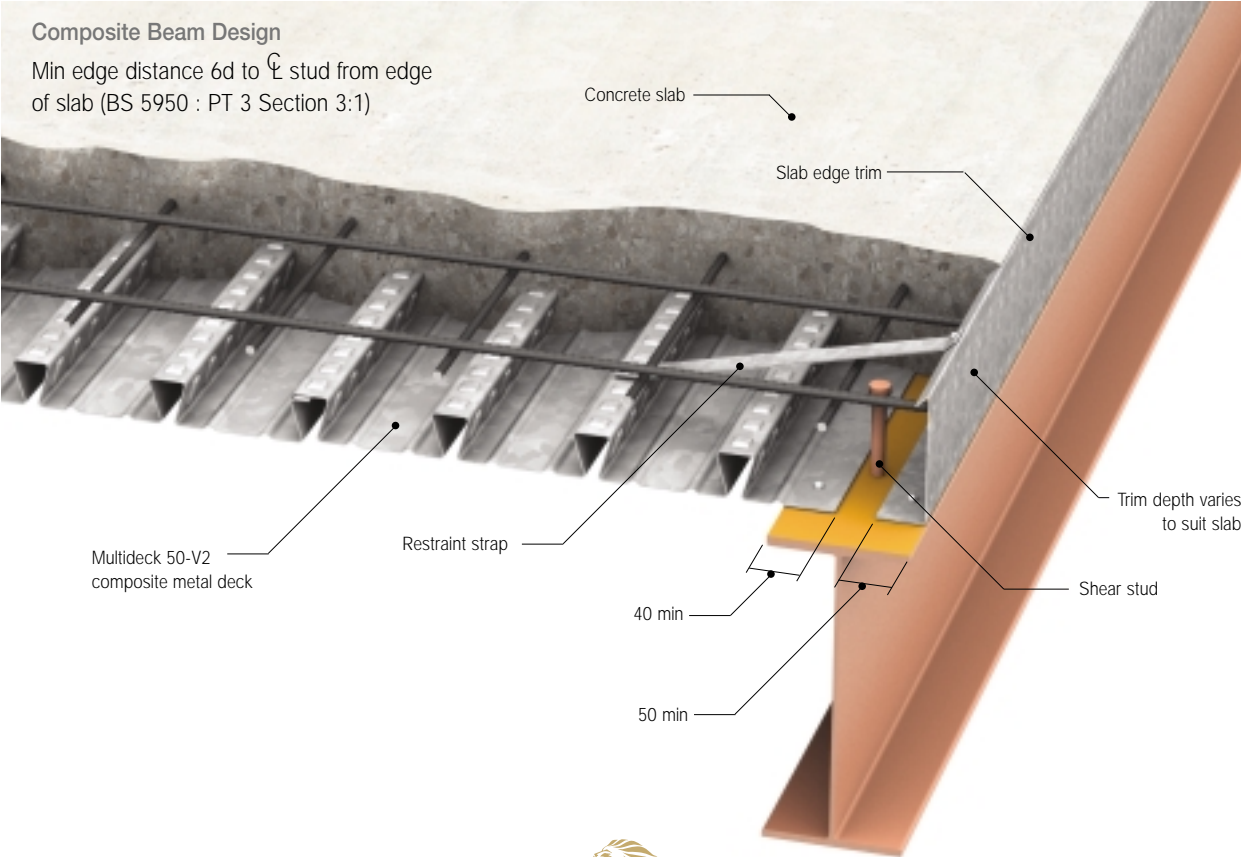
Multideck was used in the construction of the Reghed Visitor Centre, Cumbria. Photo Courtesy of MSW (UK) Ltd.

# Construction Details Multideck 50-V2

## Side Detail

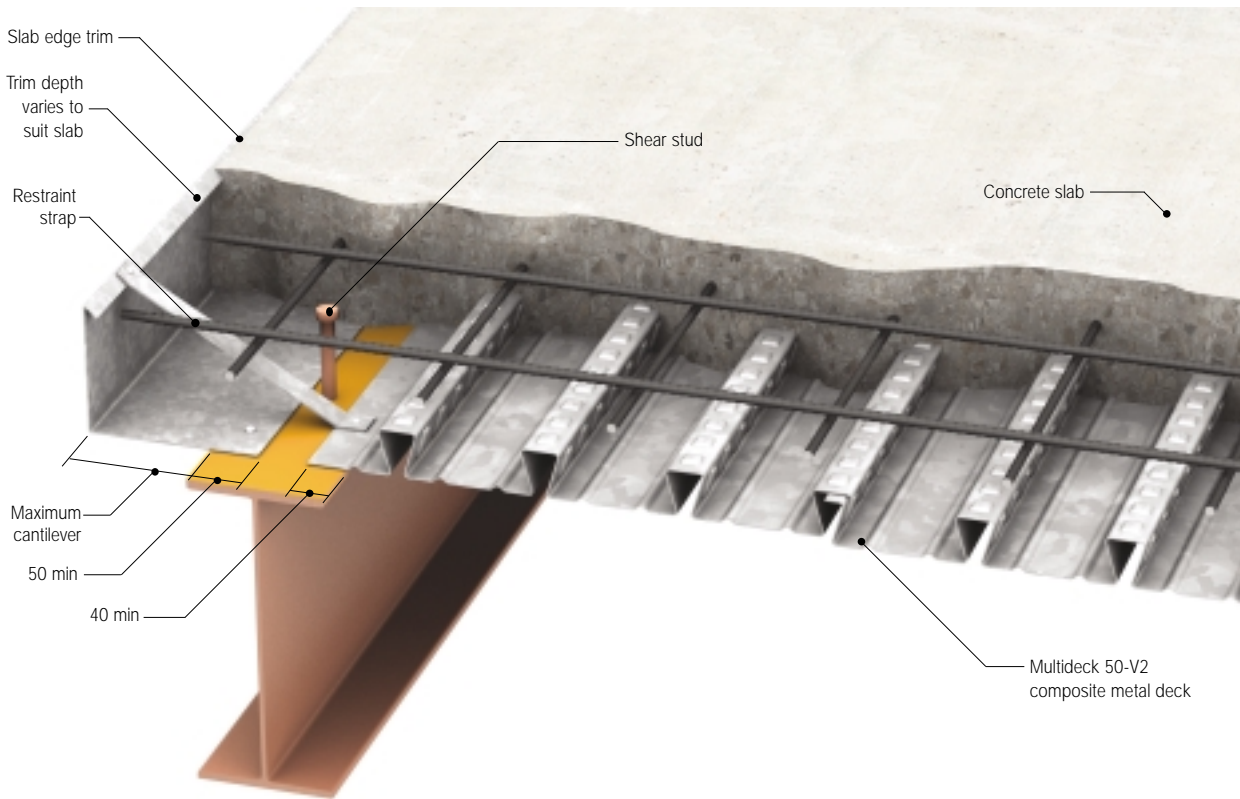


## Side Detail



# Construction Details Multideck 50-V2

## Side Detail with Cantilever



## Maximum Edge Trim Cantilevers (mm)

Slab Depth (mm)	Edge Trim Gauge (mm)	
	1.2	2.0
120	126	187
130	123	183
140	121	180
150	119	177
160	117	174
175	115	170
200	-	165
250	-	156

These values are for guidance only

### Notes:

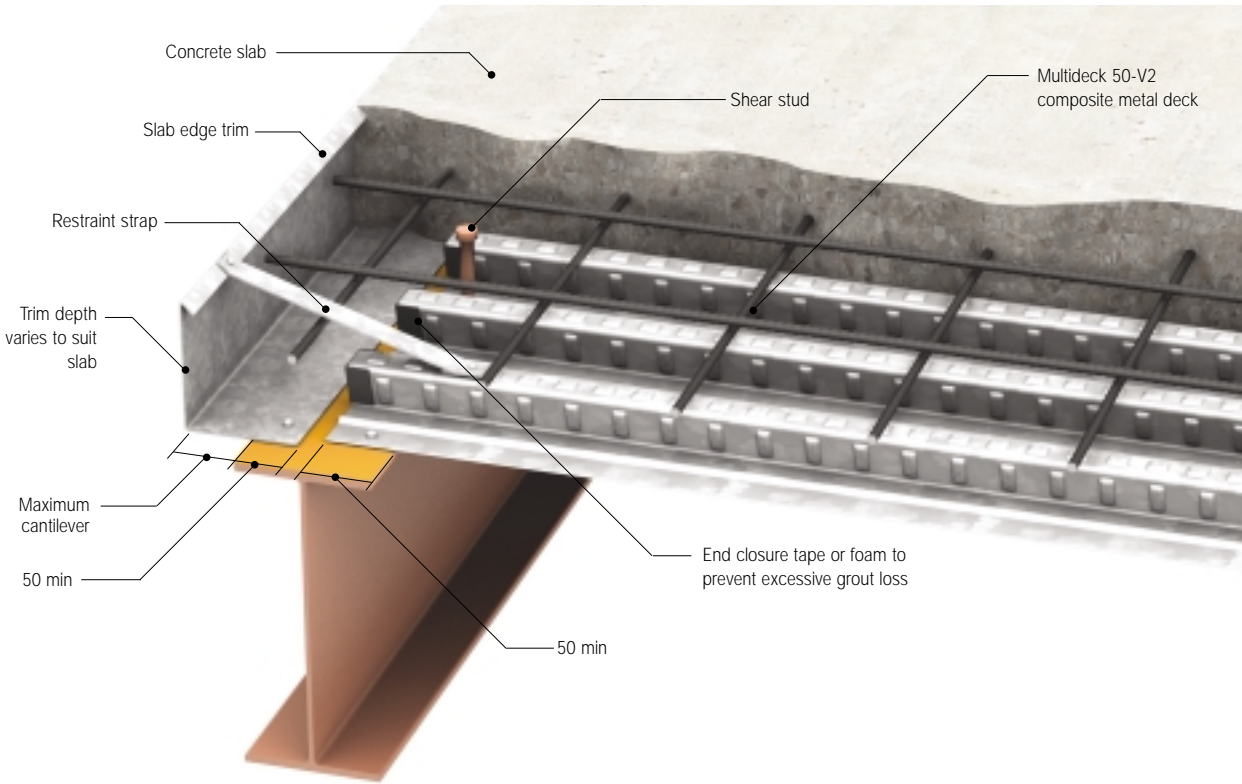
1. Deflection is limited to 3.0mm (approx) under wet weight of concrete only.
2. The table can be used for normal and lightweight concrete.
3. An allowance of 1.5kN/m<sup>2</sup> is made for construction imposed load in the bending capacity analysis.
4. Edge trim acts as permanent formwork only. Any necessary cantilever reinforcement should be designed to BS 8110 requirements.
5. We recommend that slabs of 200mm and over use 2.0mm edge trim.
6. Assumes that edge restraint straps are fixed as least every 600mm.



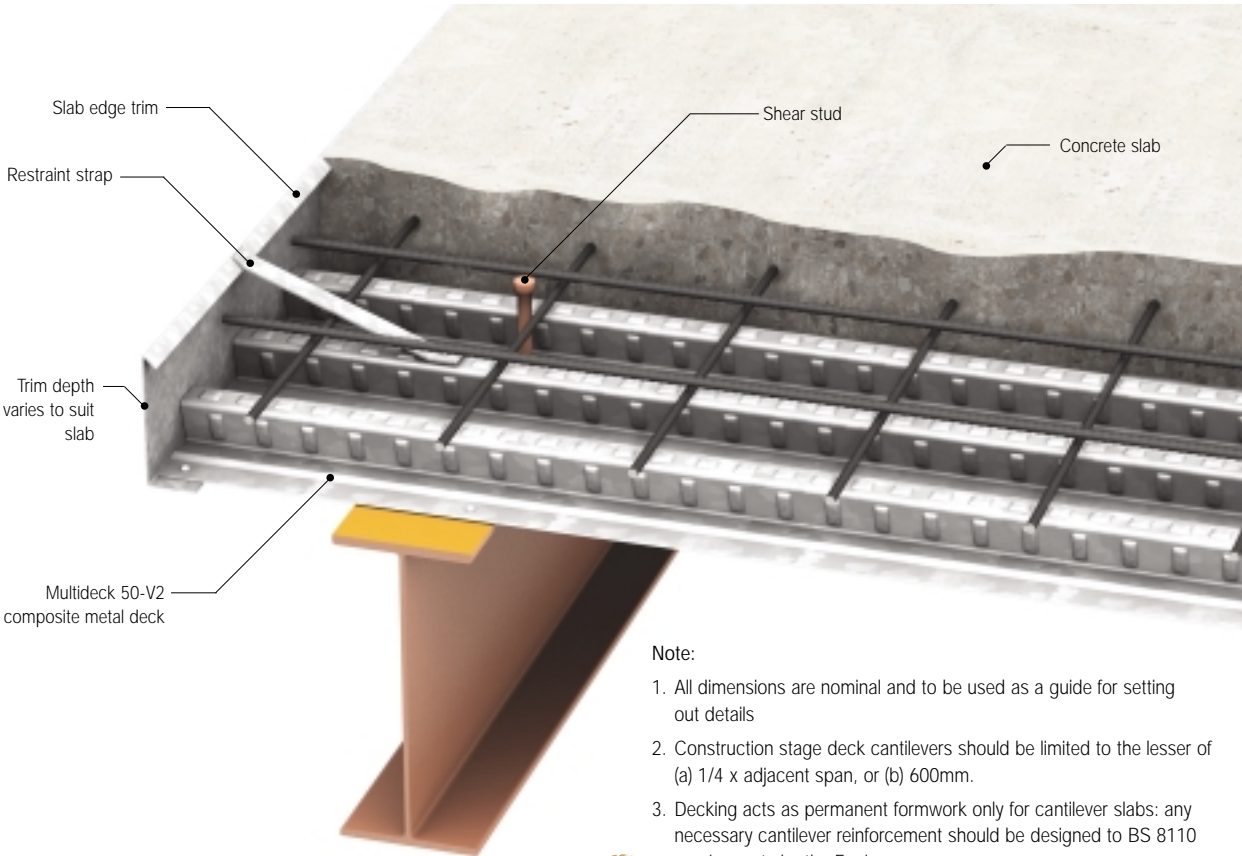
Omagh College, Tyrone, Ireland.  
Photo Courtesy of Composite Design Ireland Ltd.

# Construction Details Multideck 50-V2

## End Detail



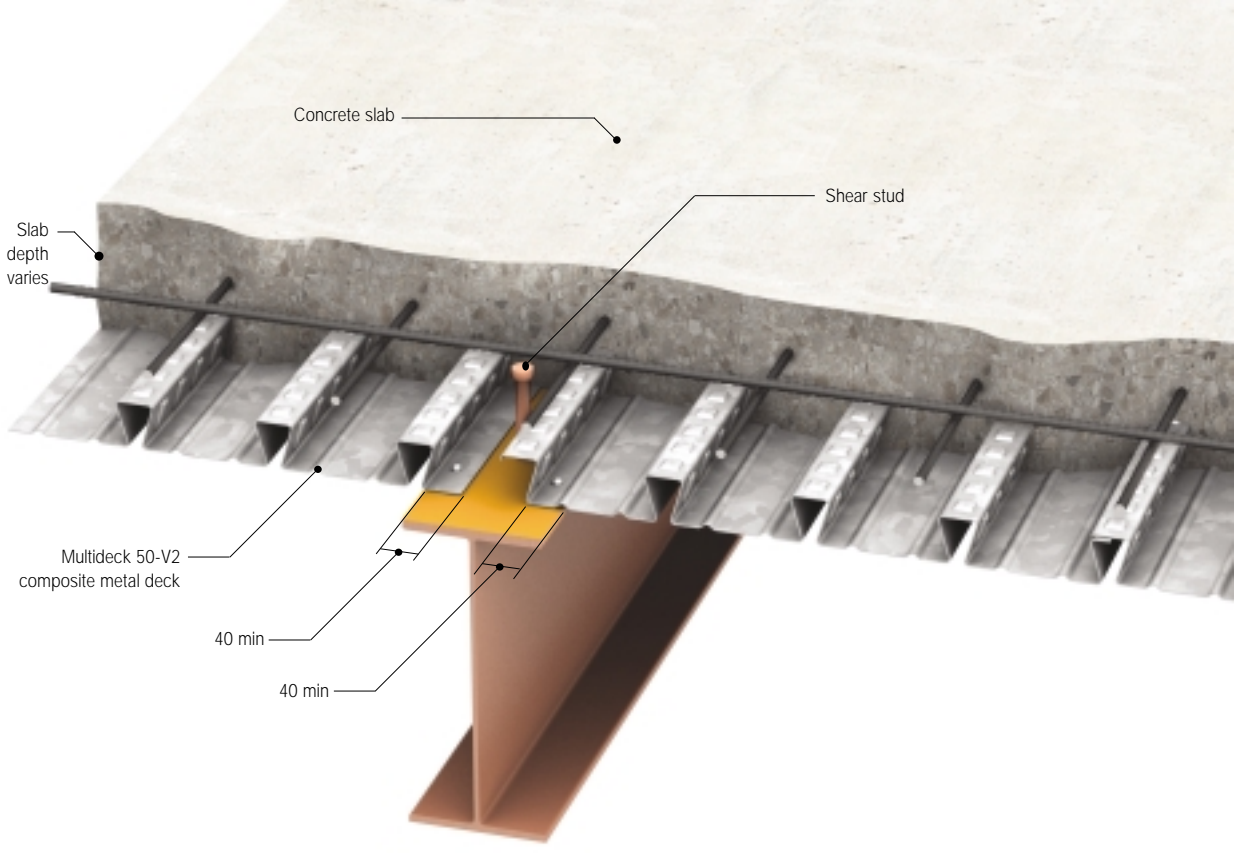
## End Detail with Cantilever



- Note:
1. All dimensions are nominal and to be used as a guide for setting out details
  2. Construction stage deck cantilevers should be limited to the lesser of (a) 1/4 x adjacent span, or (b) 600mm.
  3. Decking acts as permanent formwork only for cantilever slabs: any necessary cantilever reinforcement should be designed to BS 8110 requirements by the Engineer.

# Construction Details Multideck 50-V2

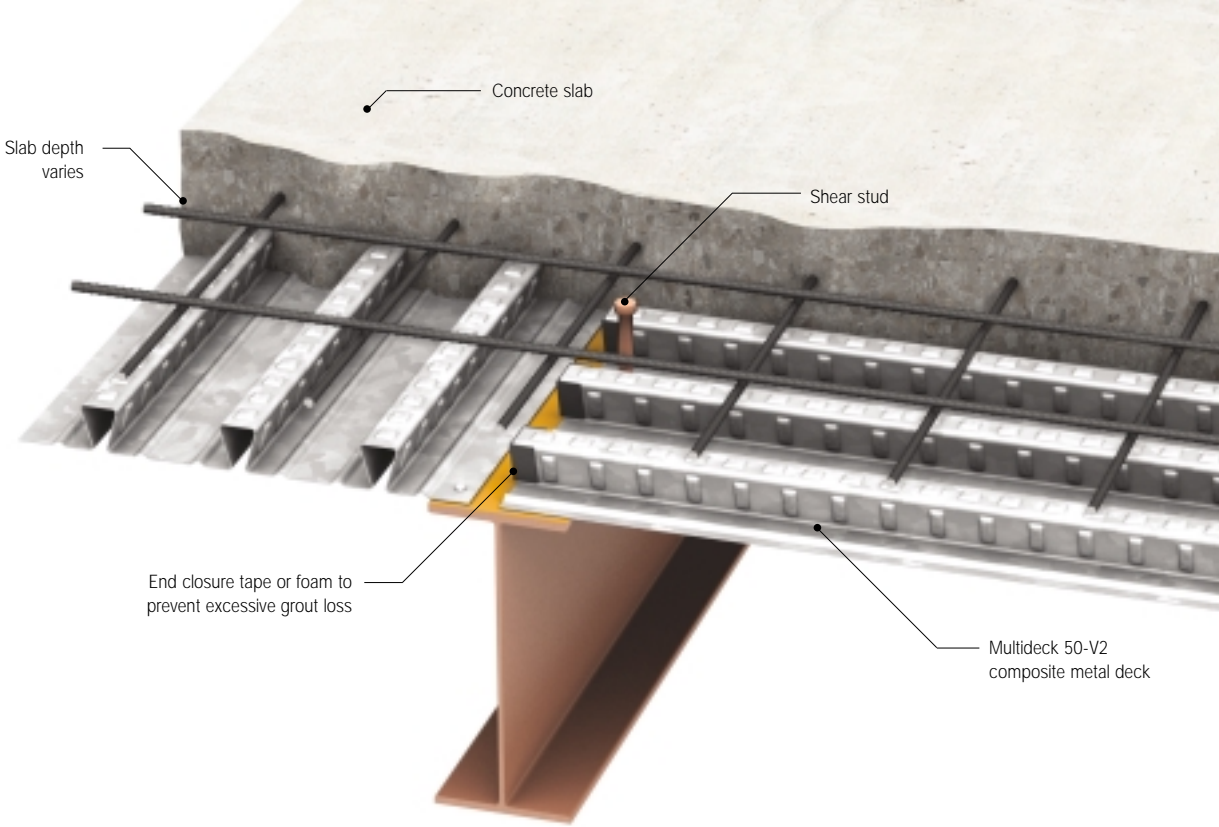
## Intermediate Beam Detail



Construction Details

# Construction Details Multideck 50-V2

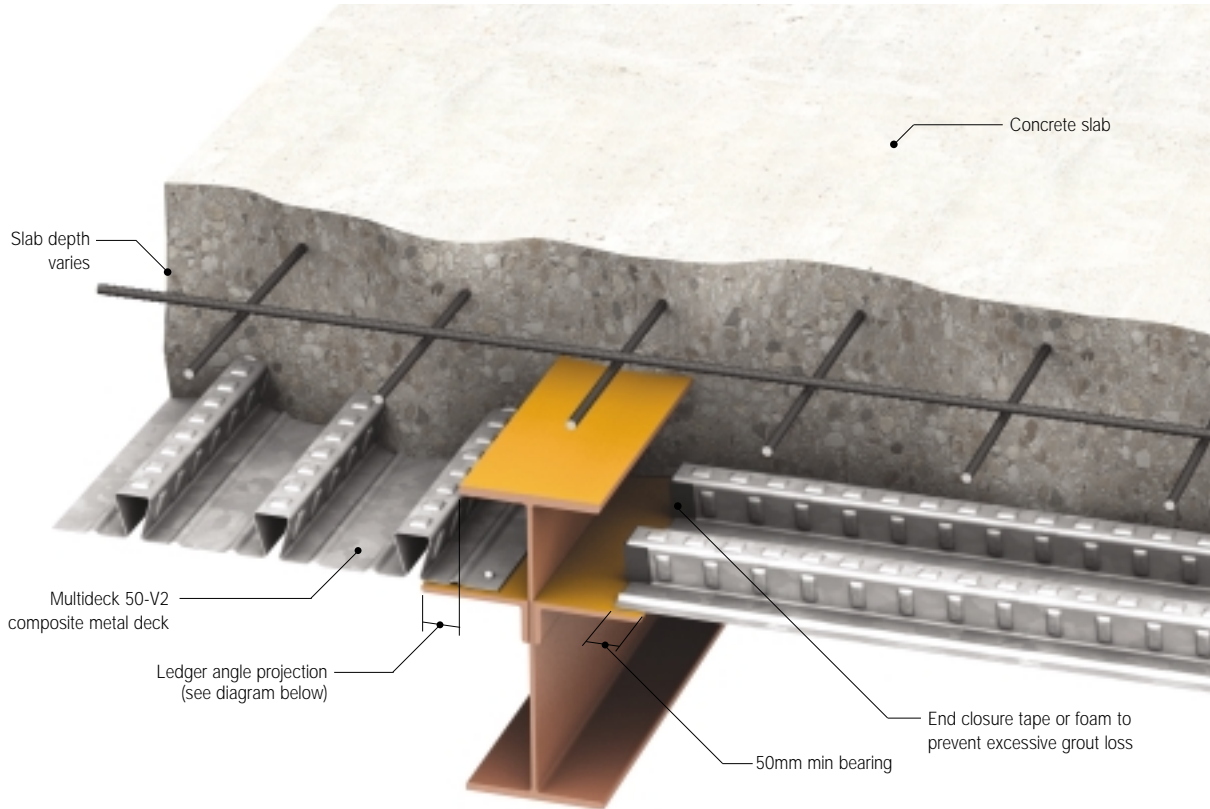
Intermediate Beam - Change in Direction of Lay





# Construction Details Multideck 50-V2

## Intermediate Beam - Change in Direction of Lay with Ledger Angle

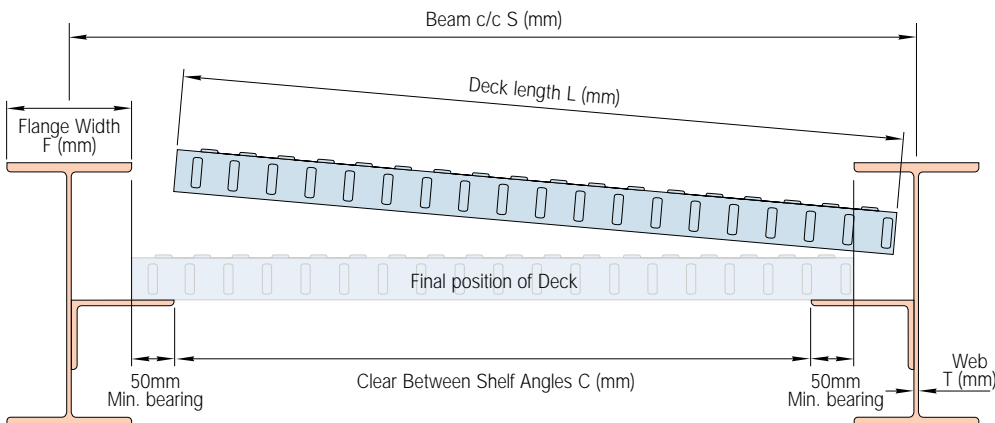


## Multideck Supported on Ledger Angles

Where Multideck is supported on ledger angles check deck length (L) required to fit and provide minimum bearing of 50mm at each end as follows.

$$L (\text{Max.}) = S - (F/2 + T/2 + 20\text{mm})$$

$$L (\text{Min.}) = C + (50 \times 2)$$

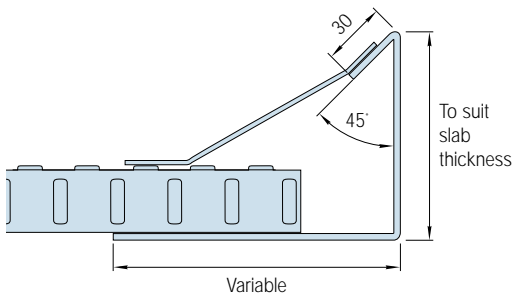




# Multideck Accessories

## Slab Edge Trim

1.2mm and 2mm galv steel in 3m lengths for cutting on site. Supplied by Kingspan Structural Products.



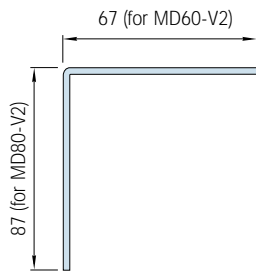
## Edge Trim Restraint Strap

0.9mm galvanised steel 40mm wide in 3m lengths for cutting on site. Supplied by Kingspan Structural Products.

## Closures

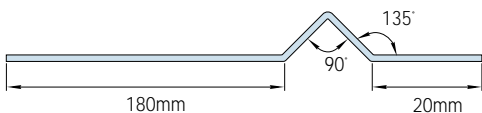
### End closure

Pressed steel supplied by Kingspan Structural Products. Length 215mm



### Side closure Profile (A)

1.2mm galvanised steel in 3m lengths. Supplied by Kingspan Structural Products.



## Shear Stud

Kingspan recommend the use of Nelson studs. These are normally supplied by the fixing contractor. All shear studs should be low carbon steel with a minimum yield strength of 350 N/mm<sup>2</sup> and an ultimate tensile strength of 450 N/mm<sup>2</sup> minimum.

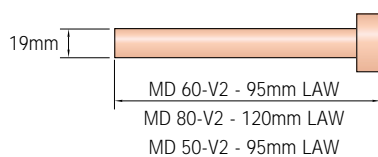


Photo Courtesy of MSW (UK) Ltd.

# Multideck 60-V2/80-V2 Suspension Systems

## Multiwedge

Material: Malleable iron to BS 6681: 1986.

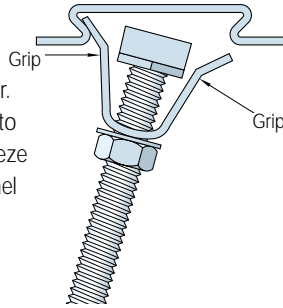
Finish: Electro zinc plated to BS 1706: 1990

Grade Fe/Zn 5c 1A.

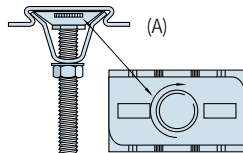
Packaging: The Multiwedge and V-nut are packed as complete units of 50 per bag.

## Multiwedge Installation

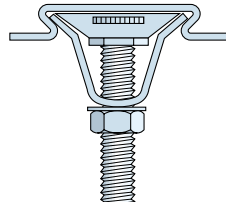
1. Position Multinut and bracket as shown. Hold assembly between thumb and forefinger. Position one leg of bracket into re-entrant channel then squeeze and click other leg into channel for 'snap fit'. Move assembly to desired position.



2. Push and turn Multinut clockwise into channel walls. Continue until in position (A).



3. Once in position tighten main M10 nut to a torque of 10Nm.



Load: 150kg (SWL).



# Multideck 50-V2 Suspension Systems

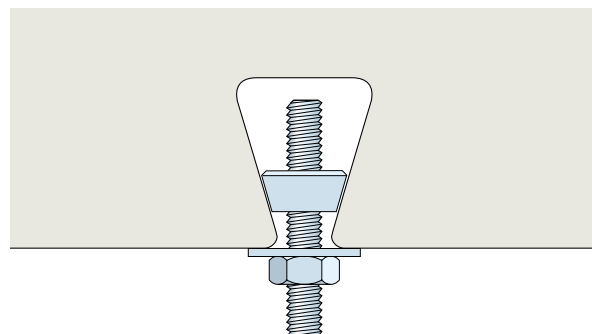


A suspension system is available for Multideck 50-V2 profiles. The Kingspan Re-entrant Multiwedge is a heavy duty suspension method for pipework, ducting, etc. and will carry loads up to 150kg (SWL).

## Re-Entrant Wedge

Material: Malleable iron to BS 6681: 1986.

Finish: Electro zinc plated to BS 1706 : 1990  
Grade Fe/Zn 5c 1A.



Multiclip, Multiwedge, Multiwedge II and Re-entrant  
Multiwedge available from:

Lindapter, Bradford, West Yorkshire. Tel: 01274 521444

For Multiwedge capacities and installation details see page 84.

# British Standard References

BS 476:	Fire tests.
Part 4 1970	Fire tests on building materials and structures.
Part 8 1972	Test methods and criteria for the fire resistance of elements of building construction.
BS 1449: Part 1	Specification for carbon and carbon-manganese plate, sheet and strip.
BS 1494: Part 1 1964	Fixing accessories for building purposes – sheet, roof and wall coverings.
BS 1881:	
Part 1 1964 (1988)	Protection of iron and steel by aluminium and zinc against atmospheric corrosion.
Part 2 1965 (1988)	Protection of iron and steel against corrosion and oxidation at elevated temperatures.
BS 3963: 1974 (1980)	Method for testing the mixing performance of concrete mixers.
BS 4078:	Cartridge Tools.
Part 1 1987	
Part 2 1989	
BS 4174: 1972	Self-tapping screws and metallic drive screws.
BS 4449: 1997	Specification for carbon steel bars for the reinforcement of concrete.
BS 4483: 1998	Specification for steel fabric for the reinforcement of concrete.
BS 5328: Parts 1-4	Methods for specifying concrete, including ready-mixed concrete.
BS 5247: 1976	Code of practice for performance and loading criteria for profiled sheeting in building.
BS 5950:	Design in composite construction.
Part 3 Section 3.1: 1990	Code of practice for design of simple and continuous composite beams.
Part 4 1994	Code of Practice for design of floors with profiled steel sheeting.
Part 6	Code of practice for design of light gauge profiled sheeting.
Part 8 1990	Code of practice for fire resistant design.
BS 6100:	Glossary of building and civil engineering terms.
Part 1	General and miscellaneous.
Part 1.3	Parts of construction works.
Part 1.3.3	Floors and ceilings.
Part 6	Concrete and plaster.
Part 6.1	Binders.
Part 6.2	Concrete.
Part 6.3	Aggregates.
BS 6399: Part 1 1984	Code of practice for dead and imposed loads.
BS 6687: 1986	Specification for electrolytically zinc coated steel flat rolled products.
BS 6830: 1987	Specification for continuously hot-dip aluminium/zinc alloy coated cold rolled carbon steel flat products.
BS 8000: Part 2 1990	Workmanship on building sites – concrete work.
BS 8110:	Structural use of concrete.
Part 1 1997	Code of practice for design and construction.
Part 2 1985	Code of practice for special circumstances.
BS 8204:	Structural use of concrete.
Part 1 1987	Code of practice for concrete bases and screeds to receive in-situ flooring.
Part 2 1987	Code of practice for concrete wearing surfaces.
BS EN ISO 9002	Quality assurance.
BS EN 10002: Part 1 1990	Method for tensile testing of metals.
BS EN 10143: 1993	Continuously hot-dip metal coated steel sheet and strip – tolerances on dimensions and shape.
BS EN 10147: 2000	Continuously hot-dip zinc coated structural steel sheet and strip – technical deliver conditions.



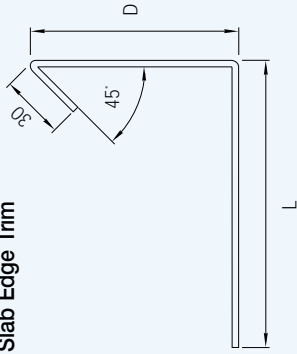


# Multideck Accessories Order Form

NAME A CUSTOMER PROJECT SUPERMARKET ORDER NO. 123194 DELIVERY DATE W/C 12/13/04

DELIVERY ADDRESS A BUILDING, A ROAD, A TOWN, POSTCODE

### Slab Edge Trim



Supplied in 3.0m lengths

MARK	QUANTITY
STRAP	150

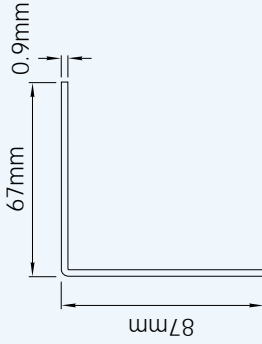
### Restraint Strap



Supplied in 3.0m lengths

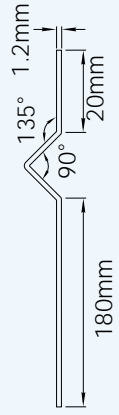
MARK	D	L	GAUGE	QUANTITY
ST1	150	220	12	150

### End Closure



MARK	QUANTITY
EA	150

### Side Closure - Profile (A)



Supplied in 3.0m lengths

MARK	QUANTITY
CL	150

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		Specification	25
		Volumes & Weights	25





Multideck was used in the construction of the Eureka Project in Halifax.  
Photo courtesy of MSW (UK) Ltd.



# Notes

# Notes



Multideck was used in the construction of New Charter Housing Trust, Ashton-under-Lyne. Photo courtesy of MetalDeck Ltd.

# Kingspan Structural Product Range

## Multibeam Technical Handbook

Kingspan Structural Products produce a complete range of pre-engineered cold formed products for modern industrial and commercial building construction.



## Multichannel Technical Handbook

The Multichannel range is contained within the Multibeam technical manual.



## Multideck Technical Handbook

Multideck is a high performance profiled galvanised steel deck for use in the construction of composite floor slabs. This publication contains complete technical information on the Multideck products produced by Kingspan Structural Products.



## Kingspan Toolkit Software

The Toolkit series has become the leading cold rolled steel and floor decking design software in the industry and is now used by structural engineers in over 1000 practices in the UK. The structural design software has been used industry wide to save valuable design time.



## Kingspan Structural Products

Sherburn, Malton, North Yorkshire, YO17 8PQ, England  
Tel: 01944 712000 Sales fax: 01944 710830 Customer Services fax: 01944 710941 Technical fax: 01944 711649  
Email: [marketing@kingspanstructural.co.uk](mailto:marketing@kingspanstructural.co.uk)

visit our website [kingspanstructural.com](http://kingspanstructural.com) or our group website [kingspan.com](http://kingspan.com)

Due to our continuing policy of development and improvement we reserve the right to alter and amend the specification as shown in this literature.



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